COMMERCIAL
OGRAPHY

Detailed Treatment of the Indian Republic and Pakistan]

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FOREWORD TO THE REVISED EDITION

The book has been thoroughly revised and enlarged by considerable additions to the description of countries which have shown recent commercial and industrial development. Detailed treatment is given of Indian Republic and Pakistan under separate chapters.

I have furnished reliable and thoroughly up-to-date statistics and facts of trade and production. At every stage data have been collected from records of various Governments, United Nation's organisations and current periodicals. The economic implications of recent political changes have also been discussed. So much new material has been included in the text that this edition is virtually a new book. The maps and diagrams form a distinctive feature of the book inasmuch as most of them were planned and drawn for a fuller and clearer presentation of text.

In the preparation of this revised edition, I received help from many friends and teachers. My best thanks are due to Prof. D. R. Mitra, M.A. (Edin.), Bar-at-Law of the Calcutta University, Prof. S. N. Banerjee, M.A., B.Com., F.C.A. of City College and Prof. Lokesh Chakravarty, M.Sc. of the David Hare Training College, Calcutta, for valuable suggestions. In conclusion, I wish to record my grateful thanks to Shri Benoy Chakravarty for cartographical assistance.

28th November, 1952
Delhi.

A. Das Gupta

PREFACE TO THE FIRST EDITION

ECONOMIC AND COMMERCIAL GEOGRAPHY has been written mainly to provide, in a small compass, the essentials of World Economic Geography upon a topical-regional basis for students of Commercial Geography in India. The book naturally divides itself into two parts. The first part deals with an outline of the principles of Economic Geography; the second part describes the world, region by region. The book does not lay any claim to originality and I must gratefully acknowledge my obligations to numerous periodicals and publications dealing with geographical matters for much of material in the preparation of this book.

Dr. S. P. Chatterjee, M.Sc., Ph.D., D.Litt., F.G.S., Head of the Department of Geography, Calcutta University, read the manuscript and offered most helpful suggestions for which I am extremely grateful. For the critical reading of certain Chapters and valuable suggestions made, I am greatly indebted to my colleagues, Prof. S. N. Chatterjee, B.Sc., Econ. (London), Prof. S. Roy, M.A., and Prof. S. K. Kar, B.Sc., A.S.A.A. (London); to Prof. R. B. Bose, M.A., B. Com., A.S.A.A. (London) of City College, Calcutta; and to Prof. P. Guha of the Jagannath College, Dacca. I must also express my gratitude to my friend, Mr. R. K. Chaudhury, Director of the Hindusthan Cotton Mills Ltd., and the Calcutta National Bank Ltd., without whose encouragement I could not have prepared this volume.

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INTRODUCTION

Economic Geography is the study of natural geographic environment and its influence on man's economic activities. It shows how the economic activities of man, so far as they relate to production, transport and distribution of commodities, and settlement of lands are influenced by physical environment. It embraces those physical conditions which affect production, transport and exchange of commodities. Thus it is concerned with the bearing of geographical facts and geographical science upon the commerce of the world. It is also within the scope of Economic Geography to describe and explain the natural divisions and artificial boundaries of countries, the distribution of population, towns and their industries, and the mode of life of the people.

Economic Geography has two functions. In the first place, it gives a correct account of the existing economic resources of the world; and, in the second place, it suggests ways in which the latter may be utilised for the benefit of mankind.

Since Economic Geography presents the actual conditions of the *world-workshop,* many of the present-day political problems can also be solved if the subject is properly understood and appreciated.

As a branch of knowledge, Economic Geography does not stand by itself. It is related to several other branches of Geography, like Physical Geography, Mathematical Geography, and Political Geography. It is also related to allied subjects like Astronomy and Geology. A proper grasp of these subjects, if not an essential preliminary, is at least very helpful to the understanding of Economic Geography.

The industry and commerce of a country are influenced by geographical features like the build, climate, and surroundings of lands—the subject-matter of Physical Geography, which is thus related to Economic Geography. Political Geography considers the effect of the physical world on the course of past history or future development. It is difficult to study the economic conditions of a region without the aid of Political Geography, which deals with the inhabitants, government, institutions and laws. Geology studies the structure and formation of the surface of the earth and primarily deals with minerals, rocks and soils that exert a great influence on man. Geology determines whether or not a region can carry on mining, generate hydro-electric power, sustain agriculture and so on. "The economic geographer is usually concerned with geology *only to the extent* that it helps to explain why certain economic activities are carried on in particular regions." Mathematical Geography is concerned with the study of the earth as a planet, its size, shape and movements, and also its tides and ocean currents which greatly affect shipping, climate and vegetation.

Economic Geography is, therefore, a part of the study of Geography.

GEOGRAPHY

Physical :	Mathematical & Astronomical :	Political :	Commercial & Economic :
(1) The build and shape of a country. (2) Climate.	The position of the earth in relation to the Solar system, tides and ocean currents.	The system of govt.; standard of living; races; etc.	Physical environment in relation to man's economic activities.

The mathematical facts of Geography are fixed, unalterable and fundamental ; so also those of Physical Geography when measured by the term of human life. Political Geography alters rapidly and, therefore, observations often pass out of date. But the practical aspects of Commercial Geography change more rapidly. Hence periods in terms of years are mentioned whenever any statement is made as regards production, trade and economic progress of a country. The principles involved in the production and trade of goods do not change. As men's needs and occupations remain the same, they must grow food, manufacture goods, exchange these with others and strive for better standard of living.

Political Economy, Anthropology, Sociology, History, Botany, Biology and Chemistry also help the study of Economic Geography by supplying it with useful information.

CHAPTER I

MAN AND HIS ENVIRONMENT

"*The mode of life of a people in any region is not an accident but the result of environment.*" It is one of the most important factors in determining man's needs, productions, habits and modes of life and his degree of progress in civilisation. To-day different countries are at different stages of economic development. In some regions people are active, progressive, industrious and highly commercialized, while in others people are relatively backward and indifferent. There are countries which are noted for manufactures, while in many agriculture is the mainstay. These differences in economic activities may be partly explained by an analysis of the correlation between man and his environment. The same type of environment may not necessarily produce a common mode of life. Environment offers certain opportunities which men may or may not utilise. Men's ability in exploiting the resources of the environment will depend upon their knowledge, intelligence and culture as well as on the social structure of the country they live in.

Environment may be physical or non-physical. Economic Geography is not only concerned with the physical environment but also with the social environment as determining factors in the development and distribution of resources of a country. Physical environment includes within its scope the location, climate, coast-line, topography, natural resources and rivers of a country.

Physical Factors Affecting Commerce

*The geographical location (situation) is a matter of fundamental importance in the commercial development of a region.**

---

* "Geographic location is a relative concept. In many cases it pertains primarily to the relationships between a specific area and larger surrounding areas via certain easy routes or approaches. As the routes or the approaches change in importance, or as there are basic changes in the economies or in the political strength of the surrounding regions, the effect of geographical location will vary." *World Political Geography* by Pearcy and Fifield.

The location of a place or a country may be of any of the following types—continental, littoral, isthmian, insular and peninsular.

Russia, Poland, Bolivia and Czechoslovakia afford examples of *continental* location. The important trade routes of the world are far off from these countries. In short, continental locations are remote and isolated from the standpoint of accessibility. A *littoral location* is enjoyed by Norway, Sweden and the Baltic States, from where the world's routes are marginally accessible.

The British Isles, Japan, Italy, India and Newfoundland possess *insular-peninsular* locations. The principal trade routes of the world are openly accessible to them. *Situation is favourable when a country possesses natural frontiers and mild climate and is in close proximity to the world markets with proper facilities for the movement of goods and persons.* Frontiers are important from the point of view of defence, commerce and nationality. There are two types of frontiers—natural and artificial. Natural frontiers are seas, mountains, deserts, swamps and rivers, which make foreign aggression difficult and breed a spirit of independence. The frontiers of the British Isles, being seas on all sides, are more easily defended from hostile attack and are not liable to changes due to wars and political revolutions. Hence the economic conditions of this country are free from changes due to alterations of boundary. In Europe, where desert frontiers are absent, the use of the river as a political frontier is very common. The following are some of the examples: (*i*) the Middle Rhine separates France from Germany, (*ii*) the Middle Danube separates Hungary from Czechoslovakia, (*iii*) the Drave separates Hungary from Yugoslavia, and (*iv*) the Lower Danube separates Rumania from Bulgaria. Rivers do not always make really good frontiers between countries, especially where the crossings are easy. For this reason, the Rhine is not an ideal boundary. Artificial frontier means land frontier when it is not marked by clear-cut geographical features like mountains, deserts, etc. It is determined by historical circumstances, agreements, treaties or wars. The frontiers of Poland, Czechoslovakia, Rumania, etc., are artificial and therefore these are frequently affected by political changes. For example, between 1938 and 1948 there have been great changes in the frontiers of many European countries like

Germany, Poland, U.S.S.R. and Italy. The boundary of Poland today is different from what it was in 1938 as it has lost about 70,000 square miles of its eastern part to Russia and has gained about 39,000 square miles on the west from German territory. This part of Germany is rich in minerals, industries and agriculture and therefore will make Poland industrially advanced. Russia has extended her boundary in the north-west by absorption of the Baltic States, occupation of East Prussia and accession of land ceded by Finland, Poland, Czechoslovakia and Rumania by treaty. The result is that the trade and industry of these countries are favourably or adversely affected by changes of boundary.

Britain furnishes an example of a country whose position in the centre of the world has greatly contributed to the growth of her foreign trade. No part of the commercial world is too far from her and she is provided with proper facilities for the movement of goods and persons. Similarly, India, at the centre of the Eastern Hemisphere and with her three sides open for sea-navigation, is situated admirably for commerce. The location of Japan in the Pacific Ocean is also an ideal one.

The most important element in human progress is the contact of many cultures. Hence a location which invites contact and provides easy access to and from other regions will promote material and cultural advancements.

It is easy for a country, situated in the vicinity of industrial areas, to develop trade and commerce. Italy was once a backward country ; but in the nineteenth century she borrowed industrial ideas, inspiration and technical processes from the neighbouring industrial countries. She has thus become a powerful industrial country. A country remains self-centred and cannot have much economic contact with the outside world if there are barriers to handicap intercourse. Till the nineteenth century, China was practically out of touch with the rest of the world because of physical barriers on all sides. Great mountains, broad deserts and the widest of the oceans kept China isolated for long. Similarly, the locations of Siberia, Greenland, Chile and Alaska discourage a ready interchange of ideas and the growth of commercial relations.

Nature of the coast-line is another geographical factor which influences man in his economic activities. Only a few countries possess no coast-line. Afghanistan, Switzerland and Bolivia are examples of the kind. The coast-line, which plays an important part in promoting or retarding the development of an area, may be of various types—smooth, high, low and broken. To be of commercial service, it must be irregular, that is, broken, so that the sea may reach far inland. By minimizing the violence of the waves, affording protection to vessels and allowing them to reach far into the interior, a broken coast-line makes possible the development of harbours and ports, and consequently contributes to the easy exchange of commodities and the growth of industry and commerce. In Great Britain, which has a largely indented coast-line and where no part of the country is more than a hundred miles off from the sea, the cost of getting exports to the sea is reduced to the minimum and the expense of shipping imports from one port of the island to any other is correspondingly small. The commercial greatness of Holland was partly the result of her broken coasts. It has been said that "the character of the coasts has made the Dutch essentially a commercial nation." By their constant association with the sea, the Dutch have become sea-faring, adventurous and enterprising. It must be admitted, however, that other factors may

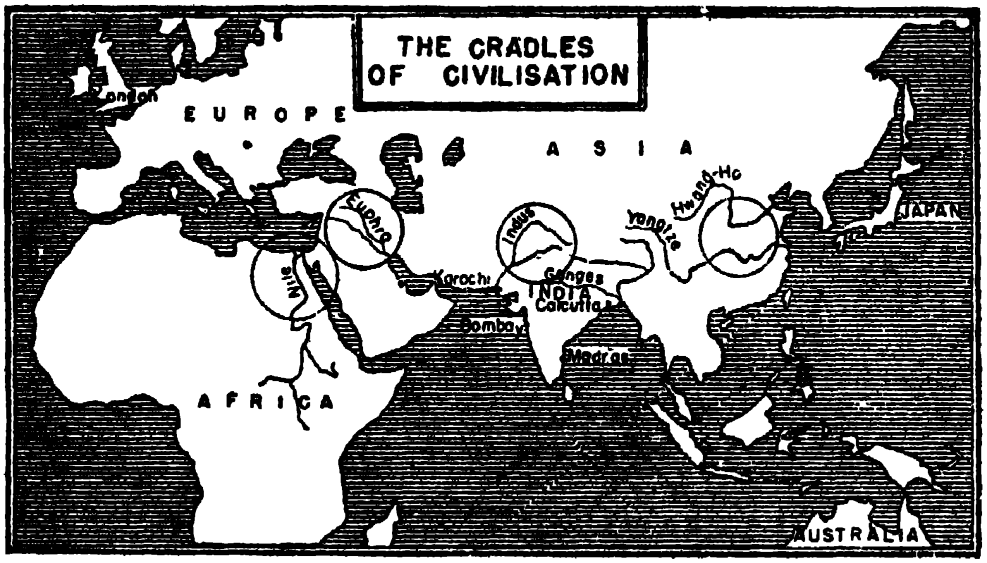

FIG. No. 1. The cradles of civilisation. The valleys of the Nile, Ganges, Hwang-ho and Tigris present favourable geographical conditions for the growth of civilisation. These conditions are the fertility of soil, natural protection and climate.

spoil the advantages which a country usually derives from a broken coast-line. Greece has a broken coast-line and in ancient times the Greeks were a sea-faring and commercial people. The modern Greeks, however, have so far failed to utilise the advantage that Nature has given them ; they are neither sea-faring nor commercial.

When the coast-line of a country is regular or high, it is very difficult to construct ports and harbours. Trade and commerce consequently suffer. The coast-line of India is not generally favourable to the construction of numerous ports and harbours, inasmuch as the western margin is regular and open to the violence of the monsoon and the eastern side is surf-bound. Consequently there are only a few major ports like Bombay, Calcutta, Madras and Vizagapatam along the entire coast-line of India. The vast continent of Africa is equally unfortunate in this respect. The coast-line of Norway, though very much broken, consists in many places of high and steep mountain walls and, therefore, it does not present "opportunities for collecting produce for shipment or for disposing of incoming cargoes".

Of all the factors of physical environment, none has played a more important role than rivers in helping man's progress and civilisation. The four great river-valleys—the valleys of the Nile, the Tigris and the Euphrates, the Indus and the Ganges, and the Hwang-ho—are the cradles of civilisation. Rivers are natural transporting agents ; they are essential for the distribution and exchange of goods. Rivers flowing in the wrong directions are, however, of little commercial value. Most of the rivers of Canada and Russia are flowing either to the inland seas or the polar regions. To be useful as transporting agents, rivers should possess certain physical characteristics : (1) They should be free from ice. When they are ice-bound during winter, like the rivers of Canada and Russia, continuous traffic is impossible. (2) They should be deep enough to allow steamers and barges to ply. The Congo, the Zambesi and the Amazon have insufficient depth at places which hinders navigation. (3) They should not have rapids and falls. (4) They should not get dry during summer.

A distinction may be made between snow-fed rivers and rivers fed by rainfall. The snow-fed rivers have, in general, constant flow of water, whereas rain-fed rivers have water during the rainy season only. The rivers of Northern India—

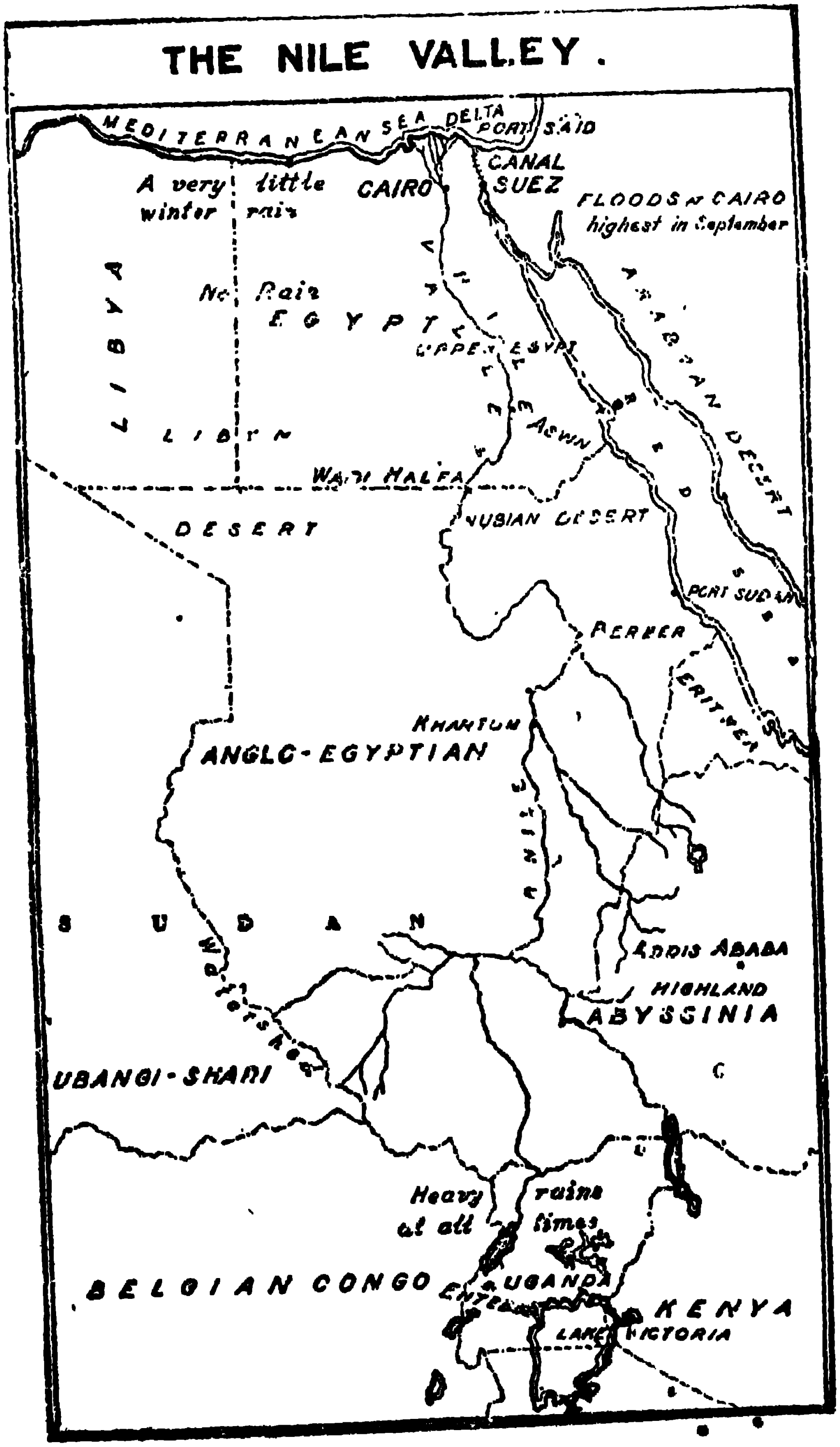

FIG. NO. 2. The valley of the Nile invited a settled life in the midst of desert.

the Indus, the Ganges and the Brahmaputra—possess most of the attributes of good navigation. Naturally, they provide highways of carriage and add to the wealth of the vast plain intersected by them. Several thousand miles of canals and channels have been constructed by building dams across these rivers to supply water to millions of acres of land. The rivers of Southern India, on the other hand, not only dry up during summer, but also have rapids and falls. They are all useless for navigation. Brazil, China, Columbia and Russia have poor railway facilities and depend mainly upon rivers for transport. In advanced countries like France, Germany and the U.S.A., rivers are used side by side with the railways.

Apart from their importance as transporting agents, rivers have other uses too. They fertilise the valleys through which they flow. All kinds of vegetation and economic products grow on the river plains. The rivers of Northern India supply soil, manure, moisture and highways of carriage for all the wealth of the plain. Many countries would have remained agriculturally backward for want of serviceable rivers. "Egypt is the gift of the Nile," so goes the saying. Without it, Egypt would have been a desert. The Nile has made the country the granary of Africa, where wheat, cotton, fruits, barley, etc. are cultivated extensively. The Nile brings down from Abyssinia fertilising mud and provides the means of irrigation. During the rainy season the Nile rises up by many feet ; embankments have been constructed to check flood. The water is distributed throughout the region by canals to provide perennial irrigation for the cultivation of summer crops.

Mountains have considerable effect on economic development of a country. They make excellent frontiers, as in Europe, the Alps, the Carpathians and the Pyrenees have done. *Mountains, as a rule, restrict settlement greatly.* High, rugged mountains impose tremendous handicaps upon the movement of people, the spread of population and the building of roads and railways. As human activities are generally restricted in regions where mountains dominate the land forms, the population in such regions is generally sparse, poor and backward. Agriculture is difficult because of the scarcity of level land, erosion of soil, difficulty of using large-scale machinery and the scattered location of the fields. Manufacturing is beset with many obstacles like poor facilities for transportation, dearth of skilled labour and great distance from consuming markets. No wonder, then, that the mountaineers have standards of living lower than those of the people of the plains. Yet mountains offer great benefits in many ways. First, in many countries they are responsible for causing rainfall; they influence the climate by keeping off winds or by condensing them. The Himalayas protect India from the severe cold winds of the North during winter, and during summer they cause rainfall by capturing moisture-bearing South-West winds. Secondly, mountains are usually sources of rivers. The mountains receive large amounts of precipitation as snow or rain, and as a result many of the world's rivers have their sources in mountains.

In Europe, the Alps is the chief source of most of the rivers which collect in innumerable valleys and flow to all parts of Europe. The Rhine after 235 miles in Switzerland flows onward to the North Sea. The Rhone reaches the French frontier 165 miles away from its source and turns south into the Mediterranean. The Irin feeds the Danube—the only river in Europe which is flowing eastward into the Black Sea. The Ticino starts from the Gattard and joins the Po which in its turn flows to the Adriatic. The rivers of India flow from the mountains. Thirdly, they afford valuable pastoral grounds. Practically in all mountainous regions of the temperate zone, grazing and stock-raising are the mainstay of thousands of people dealing in dairy products. Fourthly, they are responsible for the growth of forests on the slopes which offer varieties of raw materials for many industries. The great forest region of India is situated on the lower slope of the Himalayas. Fifthly, they are sometimes great store-houses of mineral wealth. The igneous and metamorphic rocks in mountain contain copper, gold, silver, lead, zinc and other metals. The rocks of younger formation in the mountains contain petroleum, coal, chalk and sands. In Canada, U.S.A., Mexico and U.S.S.R. many productive mines lie in mountainous regions. In these areas, aerial ropeways are often used. Sixthly, in the tropics the mountains make excellent pleasure and health resorts, particularly during the hottest months. The refreshing air and the beautiful scenery of mountains attract a large number of people from the plains in summer. Lastly, mountains cause waterfalls from which water-power is obtained for the generation of electricity for industrial purposes. Norway, Sweden, Austria, Spain, Switzerland and Italy afford examples where hydro-electricity has been developed because of the existence of many hill-streams and falls. It is, therefore, no exaggeration to say that "the influence which mountains exert on man and his activities is one of the most positive of geographical forces". The water and air in the mountains being pure and wholesome, the mountain people have better health and more energy than the inhabitants of the plains. The mountain people are generally conservative and lead a very hard life. Being detached from outside influences these people adhere to their old customs and practices. By nature they are honest and industrious. In recent years the development of communications has, to a large extent, removed the isolation of many mountain regions and brought the inhabitants into close touch with the world outside.

Though plains occupy about one-half of the earth's surface, they are the home of more than 90 p.c. of the people of the world. Plains, when they are not deserts or swamp lands, are densely populated, and people usually settle in them as long as space is available. The economic activities of man are the greatest on the plains, due to many advantages available there. The levelness of relief facilitates agriculture and transportation. The principal agricultural belts of the world are all confined to plains where temperature and soil do not vary suddenly. Plains are convenient for transport. Railway lines are easily constructed, and more than 85 p.c. of the world's railway mileage is found in the plains. The rivers in the plains have slow current essential for navigation. The Rhine, the Elbe, the Rhone, the Danube, the Dneiper and the Don in Europe, the Mississippi in the U.S.A., the Ganges and the Brahmaputra in India and the Indus in Pakistan flow through gentle gradients of the plains, and are, therefore, easily navigable. In the temperate zone, timber is an important product of the plains. The ease of mobility on plains facilitates the exchange of goods and ideas. It is no wonder, therefore, that in agriculture, manufacturing, transportation and trade the greatest development has taken place on the plains. Nearly all the great cities of the world are on the plains.

But all plains are not equally hospitable to human settlement. People do not like to settle on lowlands which have bad climate, poor drainage and unproductive soil. Adverse climate may negative all other advantages of the plains. "Some plains are too dry, others, too hot, while still others are too cold for human occupation." The Belgian Congo, the Amazon basin, the Sahara and the Tundra are thinly populated, although these are plains.

Minerals, forests and fisheries are the chief natural resources of a region. The important role played by natural resources in determining the economic life of a nation can hardly be exaggerated. Mineral wealth generally changes the mode of living. Mining is the chief industry of the mineral areas. Many regions have been industrially developed in course of exploiting mineral products ; South Africa is a prominent example. Gold is abundant there and its development has given rise to many other subsidiary industries in the country. "Gold mines are the backbone of South Africa." Similarly, Australia owes its industrial progress to her mineral products.

The forests of a country play a vital role in its general welfare and development. Forests are important sources for timber, fuel and other products which are used for domestic and industrial purposes. In the forest regions, the main industry of the people, as a rule, is lumbering ; other occupations also depend largely on the products of the forest. The forest areas of Norway and Sweden are large ; boat-building, paper and match-making and furniture industries have grown out of the plentiful trees available there. The animals of forest regions supply hide, skin and wool to the world markets. The fur-bearing animals of Canada are abundant in the forest region of the Hudson Bay ; they are trapped and killed for their pelts. The influence of forests on climate is also far-reaching. They arrest the moisture-bearing winds and cause rainfall and as such they are very important to countries where agriculture is the chief industry.

The life, industry and commerce of a country are greatly influenced by the sea, if any. Countries surrounded by oceans and seas in the temperate zone are generally noted for fishing industry. Great Britain, Norway, Nova Scotia, New Zealand and Japan have greatly developed this industry. Fishing in the high seas is the best training ground for shipping. The maritime supremacy of Great Britain is partly due to training and courage acquired by her sons through centuries of fishing in the surrounding seas. There is no more striking monument to the influence of the sea than the British Commonwealth, which is obviously the creation of a sea-faring race, gifted with characteristic courage, enterprise, endurance, resource and love of freedom. The sea which is a link as well as a barrier between the scattered units of the Commonwealth has made the British build and own more ships than any other people in the world.

The sea acts as a political boundary and gives protection against invasion. It must, however, be admitted that the advantage of sea as a protection factor has been nullified by the rapid development of aircraft.

Climate exercises a great influence on man and is even more important than physical features in determining the lines of economic advance. It is everywhere a factor which affects man and his activities. The two fundamental necessities of man are food and shelter and they are determined by climate. Natural vegetation is directly dependent on it and this in its turn is a guide to the kind of activities which will be found suitable to a particular region. Some regions are practically ruled out of account as possible homes of man. The deserts and snow-caps of the world are of this nature ; human life can exist there but only with considerable difficulty.

Climate can influence the development and localisation of certain manufacturing industries. The cotton industry requires humid atmosphere for its localisation. The fibres of cotton will break, if they are spun in dry atmosphere. The localisation of the cotton industries in Manchester, Bombay, Ahmedabad and Osaka has been determined by the moist climate of these places. Flour-milling requires dry climate, and is, therefore, localised in Budapest, St. Paul, Minneapolis and Karachi. Even Cinematography is dependent on climate because it requires bright, sunny weather. In like manner, rope-making, printing and paper-making depend on the conditions of weather. Climate also decides the type of manufactures. The climate of India, being hot and moist, favours the development of cotton industry, because the people require a material which must be light to wear. The severe cold during the winter months in Kashmir has directed the growth of woollen industry which can be carried on "indoors". In the present age, however, the localisation of manufacturing industries is not to any great extent controlled by climatic conditions. Science has made it possible to make arrangements for creating necessary air conditions in mills and factories.

Transport is affected by winds, temperature and rainfall. Heavy snowfall may render railway routes and roads temporarily impassable, and low temperature may block rivers and seas with ice. The Baltic Sea is ice-bound during winter and traffic is suspended for that period. The severe winter of North Russia and Canada freezes all the rivers. Air transport also greatly depends on climate inasmuch as it is dangerous to fly in stormy and foggy weather. In the hot deserts, the construction of railways is interrupted by sand-dunes.

The activity of mind and body largely depends on temperature. This is why dwellers in certain regions are most active in body and mind and dominate the world. In the active life of the temperate zone, climate incites man to employ all his faculties for the betterment of his conditions. But the climatic conditions of the tropical zone are not favourable to the development of body and mind ; so progress is slow in these regions. Climate, therefore, is the main factor in determining the health, energy, productivity and civilisation of the people in any region. The effect of climate on commerce can best be seen from the production of raw materials (except those of mineral origin) in the tropical and temperate zones.

Type	Tropical	Temperate
(a) Forests	Equatorial and Monsoon. Products :—Sal, teak, mahogany, rubber, cinchona.	Deciduous and coniferous. Products :—Oak, beech, pine, fir.
(b) Grasslands ..	Savannas. Products :—Cotton, maize, coffee.	Prairies, pampas and steppes. Products :—Wheat.
(c) Cultivated crops ..	Rice, millet, jute, hemp, bananas, pineapples, tea, coffee, sugar.	Wheat, barley, oats, rye, flax, grapes, apples, pears, plums, lemons, sugar beet, potatoes.

One of the most indispensable natural assets is soil. Our food and clothing and most of our shelter are derived directly or indirectly from soil. Population is always dense where the soil is fertile because of agricultural possibilities. Agriculture is always the basic industry in fertile regions. Quality of the soil has made agriculture an important source of wealth in India, China and the U.S.A. Soil is considered fertile when it contains an abundance of plant food in such a state that the plants can appropriate it as needed. There are different kinds of soil. A sandy soil is one whose composition is nearly three-fourths sand. A clayey soil is about half clay, while a lime soil is about one-fifth lime. A peaty or vegetable soil is made up of peat or vegetable matter. Loams are soils containing a mixture of clay, sand, lime and decayed vegetable matter known as humus.

The form and size of a country also play a significant part in the national economy. Form may be compact, fragmented or attenuated. *A compact form* like that of U.S.S.R. or Rumania or India or China presents excellent transport facilities and opportunities for political unification. *A fragmented form,* as in the case of Greece, imposes barriers against the movement of goods and ideas. *An attenuated form* like that of Chile (long but not wide) hinders farming operations.

The size of a country may be small, large or gigantic. A small country with an increasing population cannot depend on agriculture as the main industry. As the land is limited, agricultural produce cannot be large. Intensive cultivation may be practised, scientific manuring and other improvements may be introduced ; but there is a limit beyond which the produce will not increase. Hence people are compelled to develop other industries, and ultimately foreign trade becomes more important than internal trade and agriculture. Great Britain, Belgium and Japan are small countries with vast populations, where there has been great development of manufacture and foreign trade. A large country, on the other hand, like China or India, with dense population will cause both agricultural and manufacturing industries to develop. But it may not have a large volume of international trade because the bulk of its products may be required for the consumption or its people. Scanty population in a large country gives rise to stock-raising, as for example in Central Asia, Argentina and Uruguay.

The increasing pressure of population in smaller countries necessitates migration. Emigration from European countries to foreign lands became frequent after the beginning of the Industrial Revolution (which led to a rapid increase in population) in the eighteenth century. It is interesting to note that the European peoples have always migrated to temperate lands or to regions having temperate climates. Thus, Canada, U.S.A., Mexico, Brazil, Argentina, South Africa, Patagonia, Temperate Australia and New Zealand have been colonised by the Europeans.

The term *colony* must be distinguished from dwelling or settlement. A *colony* is a possession "in which definite settlement takes place wholly or mainly by people from the home country".

Non-Physical Factors Affecting Commerce

The economic activities of man are to a great extent determined by the character of the race, religion and government. These constitute the social (*i.e.*, non-physical) factors affecting commerce.

The economic importance of race is very great. The human race is divided into three principal colours—Black, White, and Yellow. These great races of mankind share the world's commerce unequally. The characteristics of the white peoples are an oval face, regular features, straight eyes, a finely-cut nose and white or light skin. It is generally found that the regions inhabited by the white people are commercially and politically developed to a high degree and that the control of the world trade is entirely in their hands. Their commercial and political supremacy is largely due to climate, which has made the race persevering, energetic and intelligent. "This race has exercised a great influence on the development of civilisation, in the establishment of sound social institutions, the free regulation of political and economic life and in the domains of Science, Technology and Art." The White Race includes the greater part of the inhabitants of Europe, North America, India, Middle and Near East including Egypt and North Africa. The

Yellow Race inhabits chiefly North-Eastern and Central Asia and has its greatest concentration in China and Japan. It is advanced in civilisation and takes an important part in trade.* The peoples have short statures, yellow skins, flat faces and narrow slanting eyes. The Black Race occupies the tropical regions ; it is the least civilised and takes a small part in trade. It shows in the most pronounced way the enervating and degrading effect of tropical heat and luxuriance. "In the case of the Negro, climatic influences—acting direct and through the tropical food—lead to the early closing of the 'seams' between the bones of the skull ; and thus development of the brain is arrested, and the adult is essentially unintellectual." These peoples have dark skins, flat faces, broad noses and coarse and projecting lips.

The races are also sometimes called (*a*) the Caucasian, (*b*) the Mongolian, and (*c*) the Negro.

DIVISION OF THE RACES AND THEIR NUMBER

Caucasians	726,000,000
Mongolians	665,000,000
Negro	190,000,000
Malayan	52,000,000
Red Indians	23,000,000
	1,656,000,000

Religions affect the thought and action of large sections of mankind and have geographical results. Indeed, the *influence of religion on man's economic life cannot be ignored.* By prohibiting certain activities and restricting others, the injunctions of religion not only regulate man's philosophy of life but also formulate the nature of his economic activities and ideals. The four main religions of the world are:—(1) Christianity, (2) Buddhism, (3) Islam, (4) Hinduism. Buddhism, with its doctrine of *Ahimsa,* has made its followers in China, Ceylon, Burma, Indo-China and Japan averse to stock-raising for meat and wool.

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* China and Japan are fast developing industries and manufactures; production, in both raw materials and finished goods, is increasing rapidly. New shipping routes are being established and new markets are growing. The importance of the Pacific is growing more and more and already much of the trade of the Atlantic has come to it.

The eastern regions of the Mediterranean, which are favourable for the vine, have not developed any wine industry because the population is predominantly Muslim, to whom wine is prohibited by religion. There is, however, much demand for coffee in place of alcohol in these countries. Among the Muslims banking institutions have not developed because Muhammad prohibited acceptance of interest from borrowers. There are more than 300 millions of Muslims in the world. North Africa, Western and Central Asia, Pakistan, North-Western China, Dutch Guiana in South America, Albania, Turkey and Kirghizia (U.S.S.R.) contain a large Muslim population. For religious reasons these lands have hardly any pigs. Pakistan has few pigs because of the Muslim population while China has many pigs because there are few Muslims.

The Hindu society, whose numerical strength exceeds 250 millions, is divided into different castes to each of which occupations and duties are prescribed by religion. People of one group or caste are not generally permitted by religion to follow the profession of other groups. Supply of labour for each group thus becomes fixed, and it is difficult to develop large-scale production. The Western ideas and the requirements of modern economic organisation have, however, relaxed the rigidity of the caste system to such an extent, so far as its economic aspect is concerned, that today it is no longer a force.

Christianity admits of no such restrictions. To the liberality of its principles the progress of Europe and America can be partly traced. Christianity includes three different varieties: Roman Catholic, Protestant and Greek Apostolic. The number of Roman Catholics is the largest and is estimated at more than 330 millions. They predominate in South, West and Central Europe, South America (excluding Brazil and Argentine), Mexico and the north-east of the U.S.A. The increasing domination of the Christian peoples over the earth, the gradual acceptance in all countries of their civilisation and the progress of modern education and culture are all weakening the influence of religion on the economic activities of man. But in the backward countries religion still remains a vital factor in economic organisation.

FACTORS AFFECTING COMMERCE

Physical							Non-Physical			
Climate	Situation & Size	Topography	Soil	Rivers	Natural resources	Coast-line	Race	Religion	Govt.	Density of population
(a) Production. (b) Transport. (c) Labour. (d) Industry.	Determine commercial intercourse.	(a) Plain favours settlement, develops agriculture, transport & commerce. (b) Mountain : sparse population ; minerals found ; forests abundant ; water-power available.	Vegetation.	(1) Natural transporting agents. (2) Fertilisers of valleys. (3) Develop hydro-electricity. (4) Favour growth of towns and cities.	Fishing, Mining, Lumbering.	(a) Regular ; unfit for ports. (b) irregular ; excellent for ports.	White—prominent in industry Black—least civilised ; Yellow—progressive.	Encourages or discourages certain occupations & consumption of certain goods.	Good Govt. promotes commerce ; bad govt. hinders it.	Sparse population Stock-raising ; Dense population—Agriculture and manufacture.

The commercial progress of a country is largely affected by the character of its government. Bad government always retards industry and trade ; good government promotes them. In Mexico the natural wealth is vast, but as the government was not stable, revolutions and banditry were frequent till recently and commerce was unprogressive. The absence of a strong and powerful government made China a poor country for long in spite of her vast natural resources. Japan has industrialized herself completely with the help of the state which took the initiative in starting model factories and mills. Before the first World War the German Empire extended her commerce with the active support of the state.

The extent and density of population in any area influence commerce to a certain degree. No society can develop its material life without the presence of a certain number of people. Density of population is of importance because the manner of utilization of natural resources of any region depends on the size of its population. Usually, density of 1 per square mile corresponds to hunting or fishing, less than 5 to pastoral economy, less than 10 to extensive agriculture, and above 10 to agriculture and industry. It should, however, be noted that density does not always indicate the degree of development. China with much larger density is far behind the U.S.A. in economic development : while Belgium with higher density is more developed than Poland or Rumania. The population of the world is generally distributed according to the possibility of obtaining food directly or indirectly.* The largest volume of commerce can grow in densely-populated areas, since sparsely-peopled regions need little to purchase and have little to sell. An area may be rich in natural resources but unless it is well populated, the resources will not be exploited because scarcity of population means lack of capital and labour. The most densely populated parts of the world are usually (*a*) in the neighbourhood of coal and iron mines which form the basis of the manufacturing industry, (*b*) along some sea-coasts where the cheapest commercial routes are at hand, and (*c*) in the monsoon lands of South-East Asia.

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* The world population according to U. N. Statistical Office has been estimated at about 2,399 million; half of it is in Asia.

The great deserts of North Africa, Arabia and Australia, parts of the arid interior plains and the basins of Asia and North America, the extensive coniferous forests and the Tundras of the North, together with the Savannahs and forests of the monsoon region of Australia and a large proportion of the Savannahs and equatorial forests of South America are practically uninhabited.

APPROXIMATE NUMBER OF POPULATION PER SQUARE MILE IN CERTAIN COUNTRIES

Java	940
Belgium	711
Holland	661
Japan	530
Germany	432
Italy	372
Switzerland	267
India	215
Poland	200
China	140
U.S.A.	48

AREA AND POPULATION BY CONTINENTS

	Area (in million square miles)	Population (in millions) (1941)	Number per square mile
Asia	16·5	1157·0	67
Africa	11·5	163·0	14
North America ..	9·3	198·0	20
South America ..	7·0	97·0	14
Australia	2·9	7·6	2
Europe	3·8	524·0	140

It is thus obvious that distribution and density of population is not directly connected with the size of an area. The average density of population over the world is approximately forty persons per square mile. About three-fourths of the world population is to be found in one-eighth of its land surface. These regions are (*a*) the Western end of Eurasia, (*b*) the monsoon lands and the eastern part of North America. These regions possess an abundance of fertile and arable land, adequate natural resources for manufacturing industries and favourable location for trade and the spread of ideas and other stimuli to human development.

QUESTIONS

1. "The mode of life in any given region is not an accident but is a product of environment." Explain the statement. —(Delhi H. S. 1950).

2. "The nature of coast-line of a country affects its commercial and industrial development to a great extent." Discuss this statement with at least two examples. —(Cal. Inter. 1926).

3. Write a short essay on the effect of climate on manufacturing industries. —(Cal. Inter. 1933, 1937).

4. Write a short essay on the effect of climate, both direct and indirect, on the industries of a country. Illustrate your answer with some conspicuous examples. —(Cal. Inter. 1926, 1942).

5. "The race, government and religion influence the commerce of a country to a certain degree." Support this statement by illustrations. —(Cal. B. Com. 1923).

6. "The three great rivers of Hindustan supply manure and moisture and highway of carriage for all the wealth of the plain." Explain this statement and name the three rivers.—(Cal. B. Com. 1923).

7. Give an account of the chief factors which determine climate. Illustrate your answer with reference to the continents of the world.

8. "Man's character and occupation have been decided by the geographical conditions under which he lives." Illustrate this remark with reference to Japan and India.—(Indian Institute of Bankers, 1939).

9. "The general configuration of a country affects her agriculture and commerce in many ways." Discuss this statement.—(I. I. B. 1940).

10. Write a short essay on any one of the following: (*i*) Land configuration as a factor in economic geography, (*ii*) geographical location. —(I. I. B. 1941, 1944).

11. "No factor of his environment exercises a wider influence on man and his economy than climate." How far is this remark true? Give precise illustrations. —(Indian Institute of Bankers, 1940).

12. "The human habitat is influenced largely, if not wholly, by the soil and the climate in which man lives." Illustrate this statement with reference to examples. —(Dacca Inter. 1941).

13. Discuss the factors which affect the density of population in a particular area or country. —(I. I. B. 1947).

14. Give an account of the world distribution of population. Why are some areas thickly populated and some sparsely populated? —(Cal. I. A. 1951).

CHAPTER II

THE CLIMATIC AND NATURAL REGIONS

The same type of climate does not prevail all the world over. Some countries have hot climate, some possess mild climate and others have extreme or cold climate. Economic products vary with differences in climate. Despite these differences, we find on comparison that an area in one part of the world has almost identical climate, animal life, vegetation and occupation as that of another situated far away. It has thus become possible to divide the world from the standpoint of climate and production into a number of natural regions.

Prof. Herbertson defines *natural region* as "an area of the earth's surface which is essentially homogeneous with respect to the conditions that affect human life". Within each natural region, climate, vegetation and general methods of living are similar.

In speaking of natural regions, the following considerations should be noted: The physical conditions are never fully identical in any two widely separated areas and, therefore, it must not be supposed that because they are classified as belonging to some particular type of natural region, they have all conditions in common. Secondly, the classification of natural regions, primarily on a climatic basis, is at best an approximation and and the placing of regions in a particular category means that they have more resemblances than differences in common. Thirdly, the limits of any natural region are also approximate. The change from one natural region to another is often very gradual and not abrupt. Fourthly, natural regions do not conform to political boundaries.

The study of natural regions is of great practical importance because the lands in each can be developed on similar lines. Indonesia, Brazil and Belgian Congo belong to a common natural region If rubber can be grown in Brazil and Congo there is no reason why this plant cannot be raised in Indonesia. As a matter of fact, thirty years ago, Brazil and Congo had a monopoly in rubber supply. But subsequently, rubber plantations were opened in Indonesia and Malaya from where more than 90 p.c. of the world's rubber is put in the market to-day.

1. *Types of Tropical Hot Lands.*
    - (*a*) Wet Equatorial Forest Region or Amazon Type.
    - (*b*) Monsoon and Sudan Regions.
    - (*c*) Western Desert or Sahara Type.
    - (*d*) High Plateau or Bolivian Type.
2. *Types of Warm Temperate Lands.*
    - (*a*) Western Marginal Region or Mediterranean Type.
    - (*b*) Eastern Marginal Region or China Type.
    - (*c*) Interior Lowland or Turan Type.
    - (*d*) Interior Highlands or Iranian Plateau.
3. *Types of Cool Temperate Lands.*
    - (*a*) West European Regions or Temperate Oceanic Region.
    - (*b*) Eastern Region or St. Lawrence Type.
    - (*c*) Interior Lowland or Siberian Type.
    - (*d*) Interior Highland or Altai Type.
4. *Polar Region.*

1(a). Wet Equatorial Forest Region or Amazon Type

The climatic features of this region include high temperature, very slight seasonal changes and heavy rainfall throughout the year. Temperature is high because the sun always shines from a very high position in the sky. Again, the constant excessive heat keeps the air warm and makes it expand and rise. On reaching higher levels, it cools so much that its moisture is condensed and then falls as rain. Equatorial areas are, therefore, wet as well as hot. There is much humidity in the air, and the difference between day and night temperature is greater than the annual range. The climates of these types are mostly found within about 10° of the Equator and include the Amazon basin, the Congo basin, Malaya Islands, Indonesia and the coastal plains of Columbia in South America. In these areas dense vegetation covers everything. Huge trees of great variety spread out their branches and make the lower part of the forest half dark. *So the equatorial regions are sometimes described as regions of twilight.*

PENANG (S. E. ASIA), HEIGHT 23 FT.

	J	F	M	A	M	J	J	A	S	O.	N	D
T°F	79·7	80·1	81·3	81·7	81·5	80·6	80·2	79·9	79·5	79·7	79·2	78·8
Rain	3·9	3·0	4·7	7·0	11·0	7·2	8·9	12·8	19·0	16·1	10·9	4·8

"Human life in such a region has altered little since the earliest days of man's occupation of the Earth. The climate encourages indolence, and needs are few, for an abundance of food is obtainable without effort and the requirements as to clothings and shelter are at a minimum."

Some parts of the equatorial region contain valuable minerals: tin in Malaya Peninsula and Indonesia, graphite in Madagascar and Ceylon, bauxite and manganese in the Gold Coast and the copper mines of Katanga and Northern Rhodesia. The region also enjoys monopoly in the production of bananas, cabinet-woods, spices, rubber, cocoa, dye woods and ivory—all of which are in great demand in Europe and America.

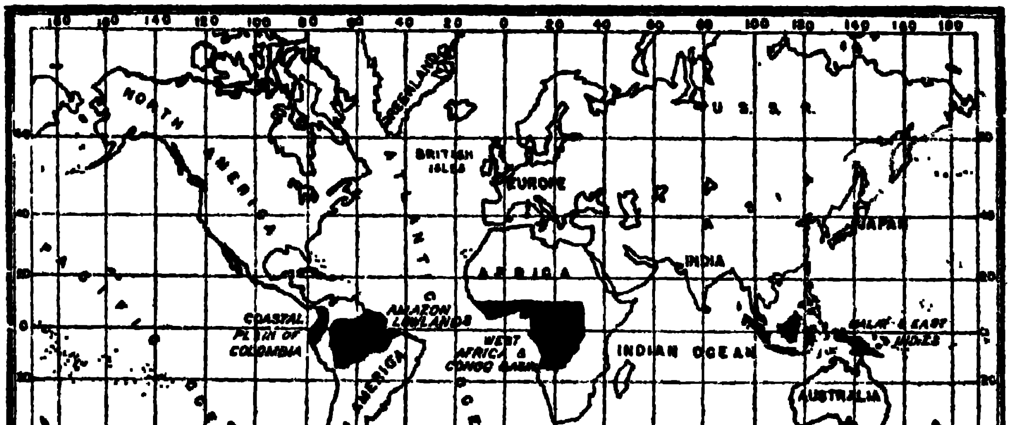

FIG. No. 3. Distribution of equatorial low-lands--the Amazon basin is the most typical.

Bamboo is a typical product of these regions. Important commercial products of wild growth are spices, guttapercha, palm, oil-nuts, coffee, cocoanuts, sago, bananas, resins, lac, myrobalans and chicle (chewing gum). The animals of the equatorial region have developed wonderful flying or climbing abilities. Birds, insects, reptiles and monkeys are abundant here. Elephants, tigers, leopards, and rhinoceroses are also found. Fur-bearing animals are practically absent.

THE PRINCIPAL EXPORTS OF THE EQUATORIAL FOREST LANDS

Areas	Chief Exports	Ports
South America ...	Rubber, timber, sugar, rice, bananas, coffee, nuts, copper.	Para, Bahia, Pernambuco, Paramaribo, George Town.
Africa	Copper, gold, rubber, timber, palm oil, kola nuts, cacao.	Lagos, Accra, Free Town.
Asia	Tin, rubber, pepper, copra, pineapples, cacao, coffee, sugar.	Singapore.

There are certain serious obstacles in developing many of these regions. Of them the most prominent are odious climate, diseases, poor soil, dense forest, paucity of food and the difficulty of using animals. The interior parts of the Amazon basin in South America present all these difficulties to regard the economic development. In the Congo basin the natives are indolent, dwarfish in size and mentally unfit for any original work. They wear little clothing, worship spirits and have *head hunting* propensities even to-day. It is not possible for white people to work in these areas because of high temperature. The means of communication are practically absent; the swampy nature of the lands and the forests make the building of roads and rail-roads difficult. The rivers and streams serve as the only means of inter-communication. In the tropical Far East however the means of communication are much better and the economic development is the highest of all equatorial lands. Here much of the land is high and therefore provides healthy climate for settlement. It is the only equatorial region in the world with a long stretch of coastline. The interior of the tropical Far East is also accessible. In Sumatra and Java the navigable streams connect the interior with the coast, while in Malaya and Java roads and railways are well-developed. Thus Indonesia has developed commerce and industry to a great extent because its favourable situation has offset the difficulty of communication and labour. It has become a great producer of sugar-cane and the largest supplier of rubber.

1 (b). Monsoon and Sudan Regions

The chief areas are India, Eastern Pakistan, Burma, Siam, Indo-China, Philippine Islands, Southern China, Central America, West Indies, Caribbean Sea Board (Venezuela and Columbia), East Africa Coast Lands, Madagascar, Queensland and North Australia Coast Lands. The monsoon regions mostly occupy the eastern margin of the continents.

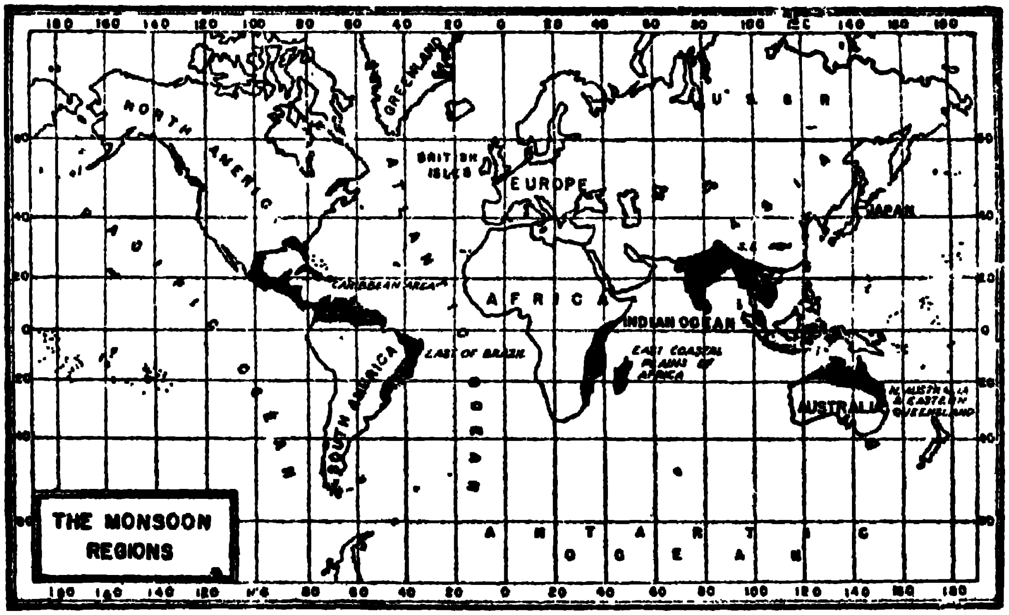

FIG. No. 4. Distribution of the monsoon lands. Note that Japan and N. E. China are not classified with the monsoon countries, though they are subject to monsoon winds. Winters are too cold in N.E. China and Japan.

High temperature throughout the year and heavy rainfall during summer are the main characteristics of this region. In summer, these areas become so hot that the air becomes thin and rises higher up ; the cool air from the sea comes in to take its place, thus causing rainfall. "Monsoon lands are dominated by winds from the sea to land in summer—the wet season, and by winds from land to sea in winter—the dry season."

The distribution of rainfall in the monsoon lands depends upon relief features. Lands having mountains opposite sea receive heavy rainfal. Cherrapunji at the foot of the Shillong plateau in Assam has about 500″ rainfall—heaviest in the world.

The climate is not generally conducive to physical or mental vigour, but it is more healthy and less enervating than the Amazon climate.

TYPICAL MONSOON TYPE (ALLAHABAD)

(Inland, Altitude 309 feet: Lat. 35° 28′ North, Long. 81° 45′ East)

Month		Jan.	Feb.	March	April	May	June
T°F		59·5	64·9	76·8	87·6	92·5	90·8
Rain (inches)		·7	·5	·3	·1	·3	4·5
Month	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
T°F	84·5	85·2	83·3	77·6	67·5	59·8	77·3
Rain (inches)	11·4	11·1	6·0	2·2	·2	·2	37·5

The products of natural vegetation are teak, sal, sandalwood, lac, bamboos, gum and camphor. Sal and teak are found in Burma, Indo-China, Thailand and Java. Sandal-wood and lac are the products of the Indian forests. Bamboos and gum are found all over the monsoon lands.

Agriculture is the main occupation of the inhabitants of all the monsoon lands. Palm, bamboos, hard woods, rice, maize, millet, sugar-cane and cotton are grown nearly all over the region. Coffee, tea, cocoa, tobacco, indigo, cinchona, jute, rubber, oil-seed and pulses are other important crops which grow in these areas. The bulk of the people take rice as their chief food. Rice is the most important crop and it grows in the river-deltas and the terraced hill slopes.

In monsoon regions man's well-being depends largely on rainfall. "Probably there is no other single group of weather phenomena which is so far-reaching in its effect on man's economic life as the rain in these areas." If the monsoon fails the agricultural products will not grow, and as a result, famine will break out. So complete is the dependence of the people on monsoon for agriculture, and so utterly unable are they to cope with its uncertainty, *that they have become fatalists of the most extreme kind.* The density of population being the highest in these regions, the pastoral industry has not developed, for it requires extensive lands. Mining is receiving attention nowadays in Burma, India and China. Northern Australia produces cocoanuts, rice, bananas and cotton. That region is capable of further agricultural development ; but the unfavourable climate does not permit white labour to settle here. Nor is Asian labour used because of the *White Australia* policy of the Commonwealth Government.

1(c). Western Desert or Sahara Type

The hot deserts of the world are generally situated near the tropics and only on the western sides of the land masses. These areas are Sahara in Africa, Arabia, Thar in India, Colorado in the U.S.A., Peruvian and Atacama deserts in South America and the Great Sandy Desert of West Australia. Deserts occupy about one-fourth of the land surface of the earth.

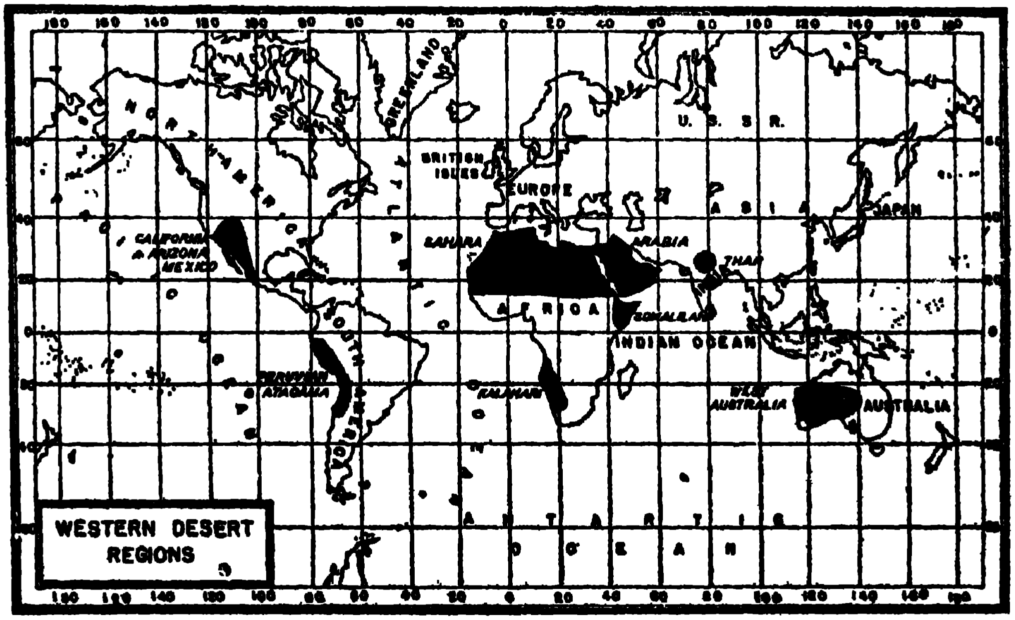

FIG. No. 5. Distribution of tropical hot deserts. Note the absence of hot deserts on the eastern margins of the continents.

Rainfall is scanty throughout the year, the mean annual rainfall being less than 2 inches. The average rainfall, however, does not give a correct position because the rainfall is erratic and uncertain in its time of fall. For four years there may be no rain, and in the fifth year one shower of 0·6 inches will make the average annual rainfall for the five year period

0·12 inches. Clouds are few; sun-shine is abundant. The summer is very hot, but nights are usually cooler than days and in winter the temperature is very low. These characteristics are modified to a great extent along the sea-coasts of the deserts. The cool ocean currents influence the climate along the desert coasts of Peru, Northern Chile, the Kalahari in south western Africa, the Moroccan Sahara, Somaliland and North Western Mexico. The land margins adjacent to the cool waters become cool with at least a ten degree difference in temperature from the normal for the latitude. The climate is not, however, unhealthy in these regions. Travelling in these areas is often disturbed by clouds of dust swept along by strong winds. In Sahara the dust storm is known as *Simoom.*

The deserts have little economic value and hinder the development of the lands near them because of the difficulty of crossing them.

The characteristic date palm and fig tree provide man's material needs in the deserts. Wheat, millet, Mediterranean fruits, cotton and sugar-cane are grown in the irrigated areas of deserts. Cattle-rearing and trade in dates, salt and leather goods are carried on. Hot deserts are all regions of privations or of lasting difficulty. Frequently a small and isolated oasis supports a scanty population. Camels, sheep and goats are reared. The people are generally fearless and reckless, but faithful and hospitable.

Some of the deserts possess useful minerals, although, curiously enough, their concentrations are found mostly in the Southern Hemisphere—oil in the narrow coastal desert of Peru; nitrate and copper mines in the Atacama desert of Chile; diamond fields in the Kalahari desert of Africa; gold-mining region of Kalgoorlie and Coolgardie in West Australia; lead and zinc in the desert region of New South Wales. In the Northern Hemisphere the important mineral-bearing deserts are the Sahara for salt, the Colorado for gold and Iraq for oil. These deserts are being developed and worked with capital from England and the U.S.A. At all desert places, the supply of water is a problem. In the gold fields of Kalgoorlie and Coolgardie, the water is supplied from Perth. The mines at the Atacama desert of Chile are supplied with water by pipes from reservoirs in the Andes.

1(d). High Plateau or Bolivian Type

The highlands of the tropics include the Bolivian Plateau, the Himalayas and Tibet. Different grades of climate are found in these areas according to height, which accounts for the difference in cultivated products. Sugar, wheat, maize and fruits flourish on the hill-slopes of the Andes, and tea on the slopes of the Himalayas. Tibet is largely a land of ice and snow, but agriculture is carried on in the valleys and fruits are cultivated. Yak, asses, cattle and sheep are reared in the lower areas.

2(a). Western Marginal Region or Mediterranean Type

It includes the Mediterranean lands (comprising Spain, Portugal, Southern France, Italy, Yugoslavia, Balkan countries, Syria and North Africa), the Pacific sea-board of North and South America (California and Central Chile) and the south-western extremity of South Africa and Australia (the south-west of Western Australia, the south of South Australia and North New Zealand). As opposed to the monsoon regions, the Mediterranean lands are mostly situated on the Western margins of the continents.

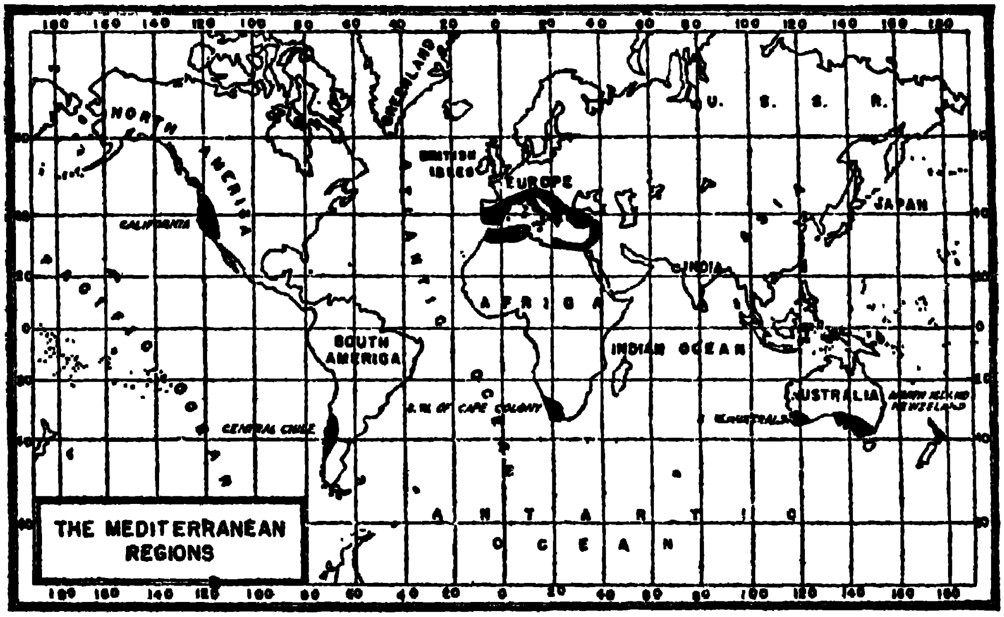

FIG. No. 6. Distribution of the principal Mediterranean lands. These lands are also known as 'Winter rain' regions.

The distinguishing climatic features are the following:—

(*a*) Most of the rains fall in winter and there is drought in summer, (*b*) winters are mild, and (*c*) skies are very sunny, being almost cloudless in summer.

The Mediterranean lands have rainfall between 20″ and 30″. These lands have mostly seas on one side and mountains on the opposite. In areas where mountains are absent, the rainfall is scanty and desert conditions prevail.

GIBRALTAR (MEDITERRANEAN TYPE) COAST. HEIGHT 53 FT.

Month	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
T°F	55	55·9	57·4	60·6	64·7	69·5	73·4	74·9	72·0	65·7	60·5	56·1	63·7
Rain (inches)	5·1	4·2	4·8	2·7	1·7	·5	·4	·1	1·4	3·3	6·4	5·5	35·7

The pleasant climatic conditions of these lands invite tourist-traffic, specially during the winter.

Vegetation grows almost all the year round. The best known characteristic plant is the olive which grows throughout the year. The cork oak, the sweet chestnut and mulberry are other useful trees. The region is mainly noted for fruits like orange, lemon, peach, apricot and fig, which are in great demand in other parts of the world. Cereals like wheat and barley are grown as winter crops. Though grapes are extensively grown all over the mediterranean region, only a few countries specialise in wine-manufacture. France, Portugal, Italy and Spain produce wine.

Fresh grapes are exported from Spain and California and dried grapes in the form of raisins from Asia Minor and California. Figs are famous in Asia Minor.

Where conditions are suitable, horses, cattle, sheep and pigs are reared. Asses, mules and goats are typical animals.

Manufactures have greatly developed in France, Spain, Portugal and Italy. The silkworm of mulberry trees has made the Mediterranean region noted for fine silk fabric. Man's struggle for existence is not severe, because the climate of these lands is highly suitable for crop production. Moderate effort is needed to gain a living from the land.

2(b). Eastern Marginal Region or China Type

The chief sections of the region are North and Central China, Western Korea, Southern Japan, eastern side of the U.S.A. (approximately Iowa, Missouri, Arakansas, Eastern Texas and Gulf Coast), South-Eastern Brazil, Uruguay, South-Eastern coast land of the Union of South Africa, sea-board of New South Wales and the Southern Queensland.

These areas get summer rains. Very hot summer and very cold winter are the peculiar climatic features in these areas.

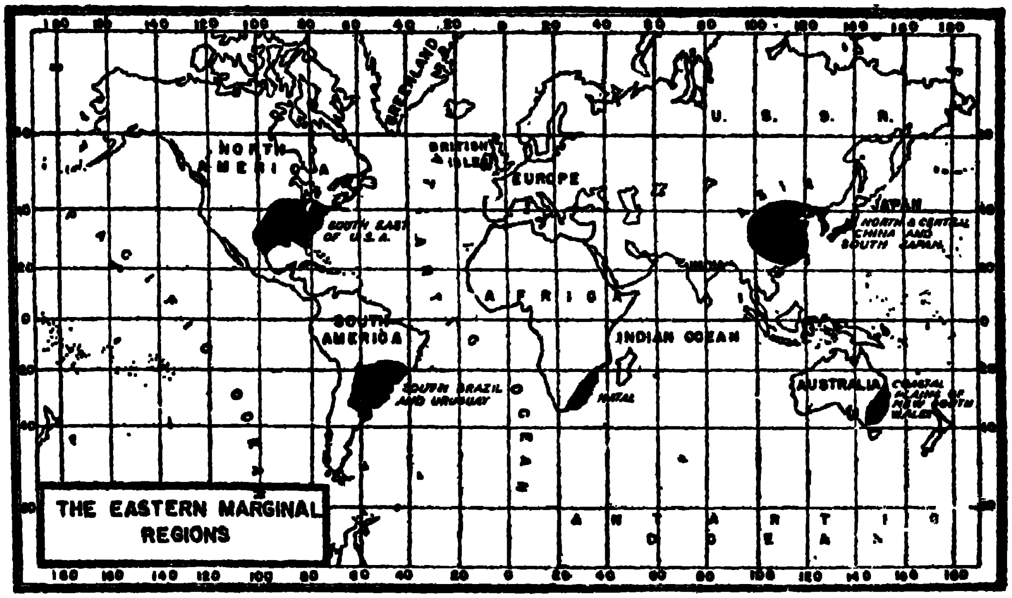

FIG. No. 7. Distribution of lands with Warm Temperate East Coast climate.

HANKOW (CHINA). INLAND HEIGHT 118 FT.

Month	Jan.	Feb.	Mar.	Apl.	May	June
T°F	39·6	41·5	48·2	61·2	70·9	77·9
Rain (inches) ...	2·1	1·1	2·8	4·8	5·0	7·0

Month	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
T°F	82·9	83·3	74·8	65·1	53·1	42·6	61·9
Rain (inches) ...	8·6	4·6	2·2	3·9	1·1	0·6	43·8

The valuable trees are yellow pines, walnut, chestnut, beech, magnolia and oak. The important crops are maize, millet, pulses, rice, indigo, tobacco, cotton, camphor, tea, banana, orange and coffee.

Population being very dense in the Asiatic lands, domestic animals are few ; but not so in Uruguay, Brazil and South Africa where cattle-rearing has developed greatly. Manufactures are well developed in southern U.S.A. and Japan.

2(c). Interior Lowlands or Turan Type

The major sections are Turan, Trans-Caspian and Caspian districts in Russia, Danubian Plains (Rumania and Hungary), Manchuria, West-Central States of the U.S.A., North Argentina, interior parts of New South Wales, Victoria and South Australia.

These lowlands have extreme climate and scanty rainfall. Cattle, sheep, horses, camels and goats are reared. With the help of irrigation maize, barley, fruits and cotton are grown.

2(d). Interior Highlands or Iranian Plateau

The chief areas are Iran, interior of Asia Minor, Afghanistan, the western part of West Pakistan, interior lands of the Southern States of the U.S.A., Mexico and interior lands of South Africa.

The climate of these highlands is extreme. The rainfall is very small and lands are either poor grass-lands or actual deserts. Generally agriculture is impossible ; but not so in areas where mountain streams and oases are found, and irrigation methods are pursued. The chief agricultural products are cereals, fruits, cotton, tobacco, sugar-cane, beet and roses. Cattle, sheep, horses and camel feed on the richer grass-lands. Though mineral wealth is great, it is not exploited for lack of labour and capital. Manufactures are carried on a small scale.

3(a). West European Regions or Temperate Ocean Region

The typical sections are British Isles, South-Western Scandinavia, Denmark, Western Germany, Holland, Belgium, France, Northern Spain, South-West Canada, North-Western States of U.S.A., Southern Chile, Tasmania and New Zealand.

These regions have moderate rainfall throughout the year as well as mild temperature. The mild climate is primarily the result of oceanic influence. Warm ocean currents flowing to the west of these regions make the winds warm and supply them with moisture.

LONDON (INLAND) LAT. 51° 28′N. LONG. 0° 19′W. HEIGHT 28 FT. ABOVE SEA LEVEL

Month	Jan.	Feb.	Mar.	Apl.	May	June	
T°F. ..	38·9	40·1	42·4	47·3	53·4	59·2	
Rain (inches)	1·8	1·5	1·7	1·5	1·7	2·1	
Month	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
T°F. ..	62·7	61·6	57·1	49·9	44	40·3	49·7
Rain (inches)	2·2	2·2	1·9	2·7	2·2	2·3	23·8

Maple, oak, elm, and beech flourish in the warm lowlands. Coniferous trees like pines and firs grow luxuriantly in the cooler and damper up-lands. Oats, rye, potatoes, beet and vegetables are the chief crops. Wheat grows best in the drier parts with sunny summers. Cattle, horses and sheep are also reared. Easy access to markets has helped the growth of dairy farming.

In the western part of Scandinavia and British Columbia fishing is more important than agriculture.

These areas are highly developed in commerce and industry. The development is particularly great in Western Europe where mineral resources are vast, transport facilities excellent, climate best suited to human energy and situation ideal for trade. "Britain leads in commerce and colonisation, France in romantic thought and taste, Germany in technical research. Agriculture is highly scientific and manufactures and commerce have reached the highest degree of development and progress yet known." Canada, U.S.A., Australia and New Zealand are also making rapid progress in manufactures and transport.

3(b). Eastern Margin of Cool Temperate or St. Lawrence Type

The main areas are the Amur Valley, Armenia, Korea, Northern Japan, St. Lawrence basin (Eastern Canada, and

Labrador, South of the Tundras, East of the Prairies), Newfoundland, U.S.A. (North-East and higher Appalachian slopes) and South-East Argentina.

These areas receive a small amount of rainfall which comes mostly in summer. Temperature is low during summer and very low during winter. The rivers and harbours are generally ice-bound in winter.

Forests of commercial value are abundant in this region. North-East America and Asia have coniferous and deciduous trees, which are important for fur-bearing animals. In the cleared areas, agriculture and dairying are practised. Lumbering is important in North America. In Canada and the U.S.A. fishing, mining, agriculture and manufacture have developed. In Asia, Japan occupies the premier position in manufactures. In Manchuria, agriculture and mining are developing rapidly under Japanese guidance and patronage.

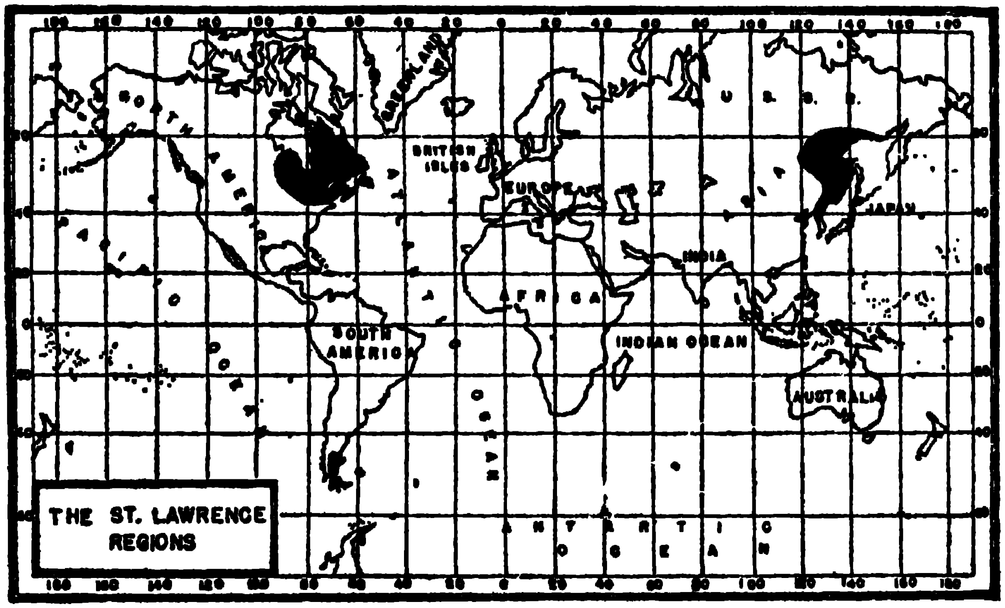

FIG. No. 8. The eastern margins of the cool temperate regions. Note the absence of such lands in Africa and Australia.

3(c). Interior Lowland or Siberian Type

The conspicuous areas are central lowlands of Asia, Poland, European Russia, Western Siberia, parts of Germany and Sweden and Northern Prairie lands of North America. There is no region of the Siberian type in the Southern Hemisphere.

These sections have extreme climate, the winter being low and severe, and summer short. The rainfall is never heavy and generally abundant in summer.

In the northern side of the region, coniferous forests of pine, spruce, firs, etc., are abundant and in the southern side trees are rare and vast grass-lands stretch in all directions. These grass-lands are called 'Prairie' in North America and 'Steppe'* in Asia. Agriculture is the chief occupation in these areas. In the arid areas stock-raising is prominent. The Western Steppes of Eurasia are very productive but the Eastern Steppes are handicapped by their remoteness from the more advanced parts of Europe. Nevertheless, some progress has been made since the construction of the Trans-Siberian Railway.

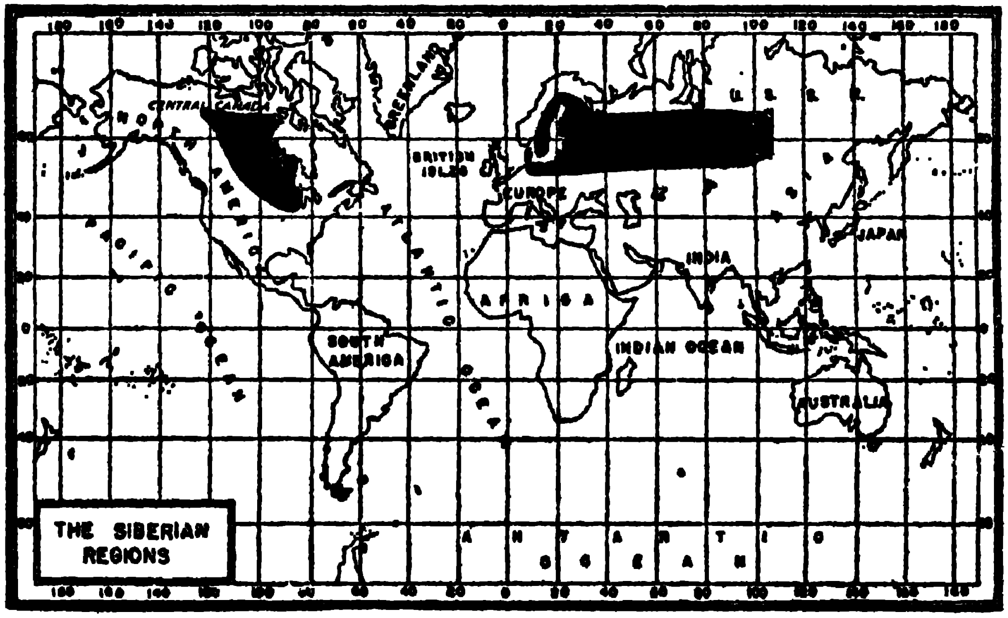

FIG. No. 9. Distribution of interior lowlands of cool temperate regions. Note there is no region of Siberian type in the Southern Hemisphere.

3(d). Interior Highland or Altai Type

The important areas in this category are the Altai Range and adjacent lands of Asia, northern parts of the Western mountain region of North America, British Columbia in Canada and the North-Western States of the U.S.A.

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* "Steppe" is a Russian word applied to all treeless districts except deserts.

Climatic conditions vary in accordance with elevation. Generally the climate of these areas is very extreme. Forests are abundant and spruces, firs, douglas and larches are the prominent trees.

Although these highlands are rich in minerals, mining has not developed much, except in British Columbia. Agriculture is practised in the valleys with the help of irrigation. Hunting in Asia and lumbering in North America are the main occupations of the people.

4. Polar Regions.

The Polar regions occupy the vast areas to the north of the Cool Temperate Zone. The regions may be conveniently divided into three parts: (*a*) Taiga or Forest region, (*b*) Tundra or plain, (*c*) Ice caps or Highlands.

POLAR TYPE. SPITSBERGEN. LAT. 82°2′ N.; LONG. 10°14′ E.
HEIGHT 37 FT.

Month	Jan.	Feb.	Mar.	Apl.	May	June
T°F.	3·7	−2·4	−1·5	7·5	23·2	35·4
Rain (inches) ..	1·4	1·3	1·1	0·9	0·5	0·6

Month	July	Aug.	Sept.	Oct.	Nov.	Dec.
T°F.	41·7	40·1	32·2	21·6	10·0	6·1
Rain (inches) ..	0·6	0·9	1·0	1·2	1·0	1·5

(*a*) Immediately to the north of the Cool Temperate Zone stretches the forest region or Taiga. Winters are long and severe with short days and long nights, while summers are short and cool with very long days and short nights. Pines, firs, larch, and other coniferous trees are abundant. The timber resources of these forests have not been exploited because of transport and climatic difficulties. In these forests fur-bearing animals are numerous. The bulk of the world's valuable pelts are collected from these regions. Agriculture, though not impossible, has not developed and the main occupation of the people is hunting and trapping. Population is consequently sparse.

Of domestic animals reindeer is the most important and is extensively reared in Alaska.

(*b*) The Tundras lie to the north of Taiga in Northern Eurasia and America within the Arctic circle. These lowlands have lower temperature than Taiga. With the exception of two months in the year lands are always covered with snow ; consequently agriculture is impossible. The Tundras are unforested with the exception of trees occasionally found in the valleys. In summer, when the snow melts for a few months, plants like mosses, lichens and grasses grow rapidly. Reindeer, caribou, arctic fox, dogs and the musk ox are numerous in the "Arctic prairies" of Northern Canada and Alaska. Fish, seals, walruses and whales are also plentiful.

The Tundras are the most desolate deserts of the world, having a very sparse population. The density of population does not exceed anywhere one person per square mile.

The means of livelihood being few, people are mostly nomads. Food and clothing are mainly derived from the Tundra animals—meat supplies the food, and skin the clothing. The people are simple and primitive, and their life is hard ; so they have little time for intellectual pursuits. The Tundras are called the regions of privation. In winter, work is impossible. The only domestic animal is the dog, useful generally for transport purposes. Though the Tundra has little economic importance, it contains some minerals which remain still unexplored.

(*c*) The Polar Highlands,—N. Alaska, N. Greenland, Antarctica, Kamchatka and other adjacent lands have no vegetation because temperature is mostly below freezing point throughout the year and lands lie covered under a thick sheet of ice and snow over 1 to 3 thousand feet in depth. Only in Greenland peaks of mountain come out of the snow sheet. Icebergs originate from these lands.

QUESTIONS

1. What is meant by Mediterranean type of climate? Account for it and compare it with monsoonal type. Also give the chief products in each of them. —(Cal. Inter. 1925, 33, 35, 40, 42; B. Com. 1929, 33).

2. What are the monsoons? Describe briefly their effect on the economic conditions of India. —(Cal. Inter. 1931; I. I. B. 1945).

3. What do you understand by "a natural region"? Into how many natural regions can the world be divided? Name them and indicate their position in a map. —(I. P. S. 1931, 32; G. C. I. Cal. 1950).

4. Explain the following phenomena :—

(*i*) In the Mediterranean region most of the rains fall in winter months.

(*ii*) Civilised man is found mostly in the lowland regions of the temperate zone. --(I. P. S. 1932).

5. Describe and account for the position of the chief hot desert regions of the tropical zone. Mention any articles of commerce that have been obtained from them.

6. "Probably there is no other single group of weather phenomena which is so far-reaching in its effects as the Indian Monsoon." Explain. —(Cal. B. Com. 1925).

7. What do you understand by a 'monsoonal' type of climate? Carefully describe its characteristic products.
—(Cal. Inter. 1944; I. I. B. 1945).

8. Discuss the characteristics of climate and natural vegetation of the Steppe Lands of the world. —(Delhi U. Prep. 1950).

9. What is the Koppen system of classification of world climates? Take any one type of climate according to this system, and account for it. Indicate the chief products of the climatic region selected by you. —(Cal. Inter. 1951).

[Hints : Koppen recognises five principal groups of world's climate which are intended to correspond with five principal vegetative groups. The five climatic groups, each designated by capital letter are as follows :

A = Tropical Rainy climate with no cool season.
B = Dry climates.
C = Mild latitude rainy climates with mild winters.
D = Mild latitude rainy climates with severe winters.
E = Polar climates with no warm season.]

CHAPTER III

AGRICULTURE

Agriculture is the art of raising plant life from the soil for the use of mankind. *The object of agriculture is to raise stronger and more fruitful crops and plants, and to help their growth by improving the soil and supplying water, when necessary, by irrigation works.* It is sometimes practised along with stock-raising, when it is termed mixed agriculture. It is the most important of all the industries in which climate and soil are the deciding factors.

Even when conditions are favourable, agriculture may not be worth adoption unless associated with certain other conditions. If a region is far from markets and is without any facilities for transport, it is not profitable to raise crops there unless it is for local consumption. Nearness to the market and transport facilities are essential to give agriculture a place in any system of national economy. By nearness to the market it must not be understood that the market should be always near at hand. A market may remain hundreds and thousands of miles away from the area of production. Argentina raises wheat for Europe: Bengal grows jute for Europe and America. Nearness to the market simply means that all the facilities are present to put agricultural products in certain markets at a reasonable price. Cost of labour is another important economic factor. Certain crops requiring a great amount of manual labour and attention cannot be profitably grown unless labour is cheap.

One special feature in connection with agricultural products is that the fertility of the soil diminishes after each cultivation. Consequently production decreases year after year. This tendency towards diminishing return may be checked to a certain extent by the application of manures and the introduction of the rotation of crops. Secondly, the yield of the same crop per acre may vary in different countries because of difference in skill of the cultivators, application of scientific appliances of cultivation and other causes.

Cultivation of land may be done by intensive and extensive methods. Extensive cultivation is necessary where the population is small, manufactures undeveloped, trade inconsiderable and the demand for the products of the soil very limited. In intensive cultivation, capital and labour are so applied as to produce the largest possible yield. The soil is carefully drained, and fertilisers are used to render the area more productive. This system is only possible where there is a great demand for agricultural products and it exists chiefly in progressive states.

The cropping systems are also different in many countries. In the U.S.A. only *one-crop* is raised in a field at a time in a year, whereas in Japan and other countries of dense population, double cropping is practised. *Double-cropping* means that a field is replanted to a second crop after the first has been harvested. There may be also *multiple-cropping* when three harvests are obtained from the same field in the course of the year. Methods of farming are not similar in every country. At present, three different methods of farming are widely used—(*a*) *humid farming,* (*b*) *dry farming* and (*c*) *irrigation farming.* Irrigation farming is practised in those parts of the hot lands where rainfall is seasonal.* In India and China irrigation farming is the rule. Canals, tanks and wells have been constructed to supply water to the agricultural fields. Irrigation has converted millions of acres of deserts into smiling fields in many monsoon lands.

There are regions which are beyond the reach of irrigation facilities and which are frequently subject to drought. Neither canals nor tube-wells can supply water to them. They depend wholly on whatever little rain they receive. Here comes in the importance of dry farming. Dry farming methods were first discovered in the U.S.A., where there are extensive areas receiving less than 20 inches rainfall per annum and having poor irrigation facilities. The following are the prominent features of dry farming: (*i*) ploughing the land in deep soil, (*ii*) terracing the land and division into compartments to allow rain-water to move only under controlled conditions, (*iii*) repeated harrowings before sowings, which conserve soil moisture and destroy weeds.

Humid farming means the production of crops in regions of moderate rainfall without the help of irrigation. √

While studying agriculture one frequently comes across the term "plantation". Plantation ordinarily means tropical or sub-tropical agriculture which is engaged in producing "planted" trees or bushes. Its purpose is the production of a single crop on an extensive scale by efficient methods and in standard forms. It is at present used in a narrow sense to denote those farms of the tropical lands where the capital, the skilled personnel, the machinery and sometimes even the labourers are brought from outside. Thus tea grown by Europeans with the help of local labour in West Bengal and Assam for foreign markets is a *plantation crop ;* but when it is grown by Indians for the inland market, it is said to be a product of *garden.*

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* Supplies for irrigation are obtained from three sources: (1) from the underground sub-soil reservoir; (2) from the storage of flood waters of natural streams or storage directly of rain-water in small tanks as in the Deccan of the Indian Union; (3) directly from the waters flowing in natural streams.

According to Mr. Reginald G. Hainsworth, Principal Economic Geographer of the U. S. D. A's Office of Foreign Agricultural Relations, *most of the world's food supply and agricultural materials for industry are produced on only 7·5 per cent of the earth's land surface (excluding the Antarctic) and that more than three-fourths of the world's cultivated land is located in only 15 countries and regions with 62 per cent of the world's population.*

The following table shows the distribution of cultivated acreage among the 15 countries :—

Country	Cultivated Area ('000 Acres)	Cultivated land as percentage of total land (Per cent)	Cultivated land per Capita (Acres)	Percentage of world cultivated land
United States ...	435,000	22·8	3·13	17·6
Soviet Union ...	414,000	7·9	2·43	16·8
India	382,610	37·9	·98	15·5
China (22 Provinces)	177,718	13·8	·29	7·2
Argentina ...	64,395	9·3	4·56	2·6
Canada	63,385	2·9	5·29	2·5
Germany ...	49,918	42·8	·72	2·0
France	49,338	36·3	1·22	2·0
Poland	47,219	49·2	1·47	1·9
Spain	44,556	35·6	1·65	1·8
Iran	40,795	10·2	2·47	1·6
Manchuria & Jehal	38,386	11·9	·89	1·5
Italy	35,610	49·9	·77	1·4
Australia ...	34,865	1·7	4·71	1·4
TOTAL ...	1,877,795	...	...	75·8

There is often maladjustment between demand and supply of many raw materials, for which it is necessary to regulate production of raw materials. The object and effect of regulation of any raw material is to raise the price to a fair level and then to stabilise its price when the fair level is attained.

Chief Agricultural Products

FOOD CROPS*

1. *Cereals.*
   Wheat, rice, maize, rye, oats, millets and barley.
2. *Beverages and Drugs.*
   Tea, coffee, cocoa, tobacco.
3. *Other Food Crops.*
   Sugar, spices and fruits.

INDUSTRIAL CROPS

1. *Fibre Crops.*
   Cotton, jute, hemp & flax.
2. *Miscellaneous.*
   Rubber, oil seeds.

FOOD CROPS

Wheat :—Wheat is the staple food of the white race. The greatest portion of the wheat crop is manufactured into flour. Large quantities of starch are also made from it. The straw is used for fodder, for bedding in stables and also in the manufactures of straw board and the cheaper grades of wrapping paper.

Wheat plant belongs to the order of grasses and grows usually to a height of three feet. Several erect stems rise from the root of the plant, and the grains grow at the end of each such stem.

Generally speaking, wheat is a product of the temperate zone. Climatic conditions are very important for its production. In the early stages of growth it requires a fair amount of moisture with cool weather to be followed by warm and sunny weather without any rain. Just before the ripening of the grains, a little rain is helpful, but when it is ripening, clear and bright days are required. Most of the world's wheat regions have an annual precipitation not exceeding 30″.

In general the best wheat soils of the world are heavy and dark in colour and of high fertility. Level land is highly

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* Less than 10 per cent of the world's land surface of 36,000 million acres is considered suitable for cultivation and not much more than 1,900 million acres produce food. This area is barely sufficient to sustain the world population of 2,000 million.

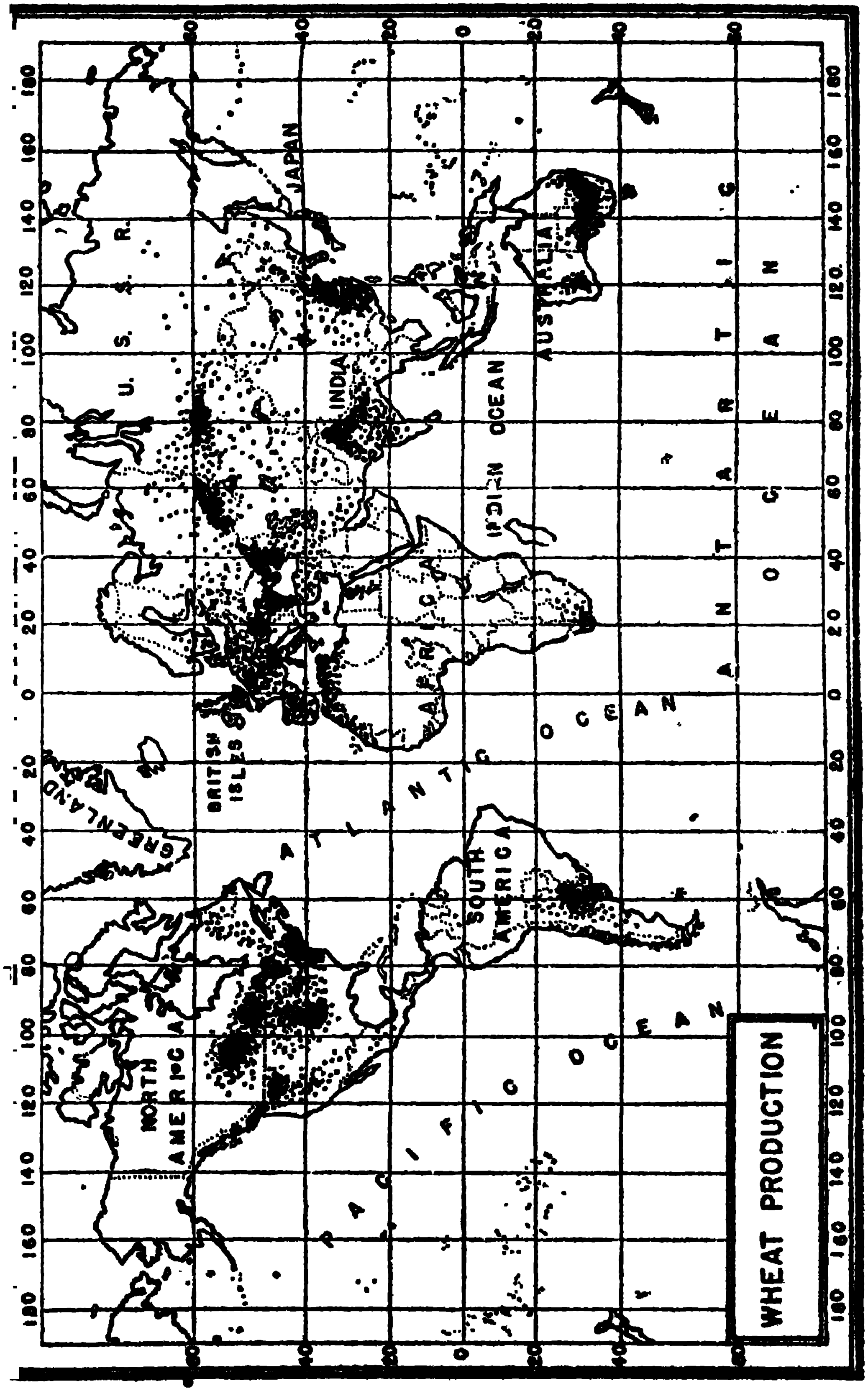

FIG. No. 10 Distribution of wheat. Notice the wheat-growing limits within 60° latitude.

favourable to extensive farming, as it permits the use of machinery necessary for modern wheat farming on a large scale.

Other factors are not less important than suitable climate and soil. Economic factors in wheat production have wrought great changes in a few decades. Introduction of farm machinery, adoption of scientific methods and improvement in transport have caused rapid expansion of wheat farming in the sparsely populated plains of Central North America, South America and Australia. Economic factors have not reached the same standard and do not work on the same basis in all countries. Thus the yields of wheat per acre vary greatly from country to country.

YIELD OF WHEAT IN THE PRINCIPAL WHEAT-GROWING AREAS OF THE WORLD*

(bushels per acre)

Country	Average (1935-39)	1947	Country	Average (1935-39)	1947
Argentina	14	14	Italy	22	17
Australia	13	17	Rumania	16	—
Canada	12	14	U.S.S.R.	12	11
U.S.A.	13	19	China	15	16
France	23	16	India	11	9
Hungary	22	13			

Because of the geographical situation of the different countries wheat is harvested in every month of the year. This factor, along with the remarkable development of transportation facilities, has resulted in an equalisation of prices in the wheat markets of the world.

TIME OF SOWING AND HARVESTING OF WHEAT IN DIFFERENT COUNTRIES OF THE WORLD

Country	No. of harvests.	Sowing Season.	Harvesting Season.
Argentina	1	April-August	November-January
Australia	1	April-June	October-January
Canada	2	(*a*) August-September	(*a*) July-August
		(*b*) April-May	(*b*) August-September
U.S.S.R.	2	(*a*) August-November	(*a*) July-September
		(*b*) March-May	(*b*) August-September
U.S.A.	2	(*a*) Sept.-October	(*a*) May-July
		(*b*) April-May	(*b*) August-September
Indian Union	1	October-December	March-May
Pakistan	1	October-December	March-May

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* Wheat situation, Dec. 1947 U.S. Department of Agriculture.

The following is the relative position of the different countries in respect of wheat production.

WHEAT: ACREAGE AND PRODUCTION

Country	Area ('000 hectares)		Production ('000 metric tons)	
	1934-38	1950	1934-38	1950
Bulgaria	1,353	—	1,690	—
France	5,224	4,319	8,143	7,701
Hungary	1,589	—	2,220	—
Italy	5,040	4,719	7,254	7,614
Rumania	2,537	—	2,600	—
U.K.	754	1,003	1,743	2,648
U.S.S.R.	40,920	—	38,090	—
Canada	10,043	10,935	7,170	12,565
U.S.A.	22,431	24,985	19,476	27,944
Argentina	6,783	5,700	6,634	5,500
China (22 provinces)	20,154	—	21,743	—
India	10,312	9,759	7,139	6,390
Australia	5,253	4,735	4,200	4,981
World Total (excl. U.S.S.R.)	127,800	131,300	128,600	146,000

The wheat-producing regions of the world are divided into two groups: those producing only for domestic consumption, and those producing for domestic consumption as well as export.

The most densely populated countries of the world like U.S.S.R., China, U.S.A. and India are the greatest wheat-producers. Home consumption being great, these countries cannot export wheat in large quantities. Canada, Australia and Argentina, which are all sparsely populated states, handled normally before 1939 as much as 82 per cent of the international wheat trade. It is interesting to note that these three countries produce only 12 per cent of the world's wheat.

During the post-war period, however, a change has taken place in the wheat trade. There is now a great demand for American wheat in European markets. Bulgaria, Rumania, Hungary and U.S.S.R. are in normal times wheat surplus areas and supply wheat to European markets. But due to war devastations, these countries have not yet been able to reach the pre-war level of production. The volume of wheat export from Australia and Argentina has also declined. As a result, the U.S.A. is now the leading wheat-exporting country in the world.

WHEAT AND WHEAT FLOUR : EXPORTS, 1948-49 TO 1950-51

(Millions of metric tons, wheat equivalent)

Region	1948-49	1949-50	1950-51
Source :			
United States	13·80	8·65	10·25
Canada	6·04	6·43	6·14
Australia	3·42	3·13	3·46
Argentina	1·65	2·42	2·81
Other countries	2·09	2·39	2·73
Total ..	27·00	23·02	25·39
Destination :			
Europe	17·18	12·81	13·90
Asia	5·86	5·66	5·44
South America	1·39	1·59	2·35
North & Central America	1·11	1·56	1·73
Africa	1·17	1·16	1·59
Oceania	0·28	0·22	0·20
Area unspecified	0·01	0·02	0·18
Total ..	27·00	23·02	25·39

In 1950-51, the U.S.A. accounted for 51 per cent of the total exports of wheat of the world, while the others' shares were Canada 23 per cent., Argentina 11 per cent. and Australia 13 per cent.

Great Britain is the greatest importer of wheat, consuming as she does more than 40 per cent. of the wheat offered to the world market.

U.S.A. is the greatest wheat-producing country and the raising of this crop is carried on in Kansas, North Dakota, Nebraska, Oklahama, Illinois, Washington, Missouri, Minnesota, Ohio and some other states. In 1950, the U.S.A. produced about 28 million tons of wheat against 19 million tons in 1939. North Dakota and Kansas supply more than 4 million tons of wheat each. Between North Dakota and Minnesota, extending into Canada, is the Red River Valley, which is such a prolific wheat-producing country that it is known as the 'Bread basket of the world'. The great wheat centres are Minneapolis, Duluth, Chicago and Buffalo. The Pacific States were once the important producers of wheat. In recent years the production has decreased because fruit-farming has proved more profitable in these areas. Although in recent years the U.S.A. has been exporting wheat in considerable quantities, normally, the country does not export wheat, as it has to support a population thirteen times more than that of Canada.

Soviet Russia is the largest wheat-producing country in the world. Normally she raises more than 17000 million bushels of wheat a year in about 100 million acres of land. Wheat is cultivated both in spring and winter. Spring wheat accounts for about 65 per cent of total wheat acreage. The main regions of spring wheat are the Volga region, the Trans-Urals, the Kazak and the Ukraine. Winter wheat is cultivated in the Ukraine, the North-Caucasus and Crimea. The rapid extension of wheat lands is due to a more intensive system of work, the mechanisation of agriculture, and to more healthy conditions of work on collective farms. Kherson and Odessa on the Black Sea handle the bulk of the export trade in wheat. The other important wheat centres are Moscow, Gorki and Orenburg.

Canada has become one of the great wheat-producing countries of the world. It raised in 1950 about 13 million tons of wheat as compared with 7 million tons in 1939. Her wheat lands are Manitoba, Saskatchewan, Alberta and Ontario. Winnipeg and Port Arthur are great centres of wheat production in the Dominion. Decreasing fertility of land in Manitoba and Saskatchewan, and the opening of railways in the west are factors responsible for the shifting of wheat cultivation to further west, *i.e.,* Alberta. Canadian wheat is exported through

New York (40 p.c.), Vancouver (25 p.c.), Montreal (15 p.c.), Halifax, St. John and Portland. Europe normally imports 88 p.c. of Canadian wheat. The United Kingdom alone takes about 60 p.c. of Canada's total exports of wheat.

In India wheat is cultivated in the East Punjab, U.P., Madhya Pradesh and Berar, Madhya Bharat, Bombay and Bihar. Pakistan grows wheat in Sind, West Punjab and North-West Frontier Province in an area of about 9 million acres of land. India and Pakistan produce about one-tenth of the world's total crop and occupy the fourth place. India, however, is not in the rank of wheat exporters. India before the partition produced almost wholly for domestic consumption and was never a factor in the export market. When the price of wheat was high in the international market or when there was a surplus in India, a portion of it was exported and in such cases India influenced the world price of wheat.

Although the population of the world is growing and the consumption is increasing, the improved methods of production and the utilization of available areas in Australia, Siberia, China and in some parts of South America have increased the supply of wheat more rapidly than the demand. It is estimated that in Australia about 200 million acres of land are suitable for wheat cultivation. At all events, there is ample room for wheat expansion in Australia, Russia, China and South America.

The World Wheat Conference met in March, 1949 at Washington (U.S.A.), and drew up an agreement to assure the importing nations a dependable supply, and to give each exporting country 'a fair share' of the world market. It is a multi-lateral four-year contract among 36 importing nations and 5 exporting countries. The five exporting countries are Canada, U.S.A., Australia, France and Uruguay. So far U.S.S.R. and Argentina have not participated in the agreement. Argentina held out for excessive prices and U.S.S.R. for excessive quotas. The five exporting countries have guaranteed 456 million bushels of wheat annually. The respective quotas are: Canada 203 million bushels, U.S.A. 168 million bushels, Australia 80 million bushels, France 3 million bushels and Uruguay 2 million bushels.

Rye :—It ranks next to wheat in importance. It originated in Siberia and is raised farther north than any other grain crop. It has been cultivated in Asia and Europe from time immemorial and for centuries it has been one of the most important food plants. It is also used for the preparation of Gin. The straw is used for making horse-collars, mattresses, baskets and straw hats.

Rye is distinctly a crop of cool and moist climates. It thrives in fertile as well as in poor lands. The principal rye-producing countries are the U.S.S.R., Germany, Poland, Rumania, Holland, Scandinavia, Hungary, British Isles, U.S.A., Argentina and Canada.

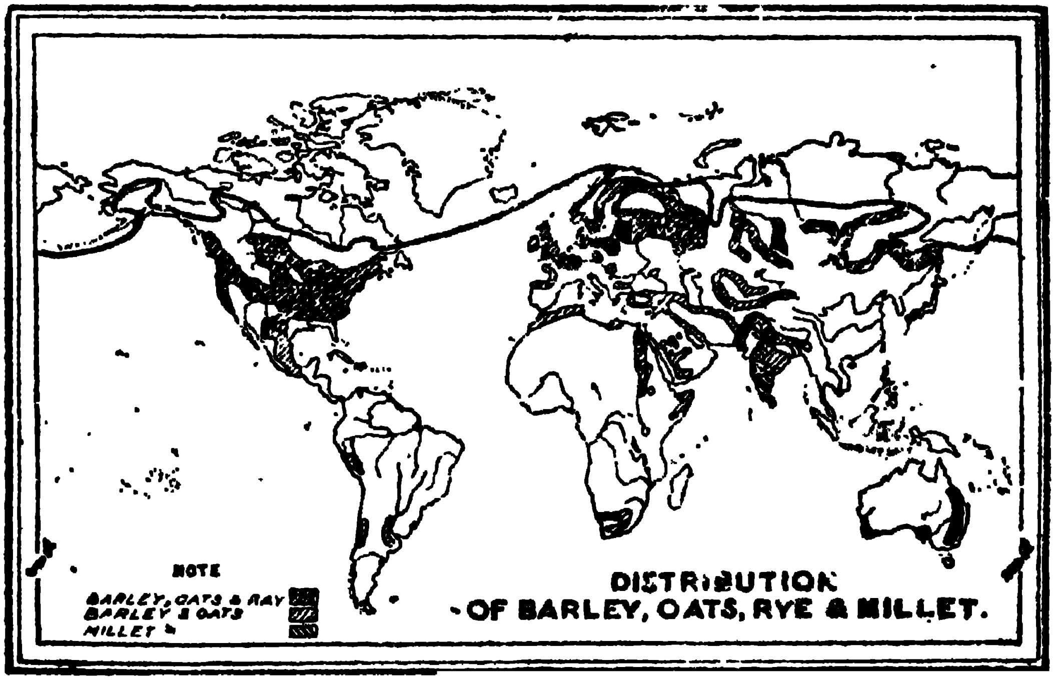

FIG. No. 11. Note the concentration of barley production in U. S. A. and U. S. S. R.

In 1950-51 world production of rye was 19·3 million metric tons compared with 21·0 million metric tons in 1938.

In U.S.S.R. nearly 50 per cent. of the total crop of the world are raised. As rye is less exacting than wheat in regard to climate and soil, it has a wide distribution in Russia. About 60 million acres of land are under rye cultivation, and the regions are R.S.F.S.R., Ukraine, Byclorussia, Trans-Caucasia and the Kazak. The average yield of rye is 20 bushels per acre. Germany raises about one-sixth of the world production. Rye is essentially a crop grown for home consumption, and the international trade in the commodity is very small. U.S.A., Canada and Argentina export a considerable portion of their limited crops and there is some movement from the greater producers of Scandinavia and other European countries.

Barley —It is one of the cereal grains. It is a bread grain and is also a common ration for horses, cattle and pigs. Barley is used for thickening soups and also for the manufacture of beer and whisky.

In general appearance and manner of growth, barley resembles wheat. It requires high quality soils and cannot be grown in soils which are sandy, poor or infertile. Its growing season is the shortest of all grains. Among its many varieties some thrive best in the warm temperate lands and some are cultivated farther north than any other cereal crop. Barley grows best in the Mediterranean regions during the winter months.

The world's barley crop is about one-third of wheat. Europe raises approximately one-half and Russia alone about one-third of the world's supply. Since 1939, reliable data of production of barley in Russia are not available. In 1939, Soviet Russia had 21 million acres under barley crop. Barley is mainly cultivated in Ukraine and North Caucasus. The average yield of barley in the U.S.S.R. is 21 bushels per acre.

WORLD BARLEY PRODUCTION

1944-46

	Million bushels	Per cent.
China ...	... 307	14·6
U.S.A. ...	... 269	12·9
Germany ...	... 105	5·0
India ...	... 115	5·5
All others ...	... 1285	62·0
	2085	100·0

The world production of barley was 46·4 million metric tons in 1950-51 compared with 42·5 in 1949-50.

Russia, U.S.A. and China head the list in the production of barley. Methods of cultivation are not the same in every producing country. Denmark has the highest yield of 2,656 lb. per acre in the world with Germany, the United Kingdom and Japan not falling far behind. In France, U.S.A., Hungary, China, Canada and Poland the outturn ranges from 1,000 to 1,200 lb. per acre. The outturn is low in India, U.S.S.R. and Rumania where it is between 500 to 800 lb. per acre. The chief factors on which the yield of barley depends are soil, moisture supply, quality of seed and method of cultivation.

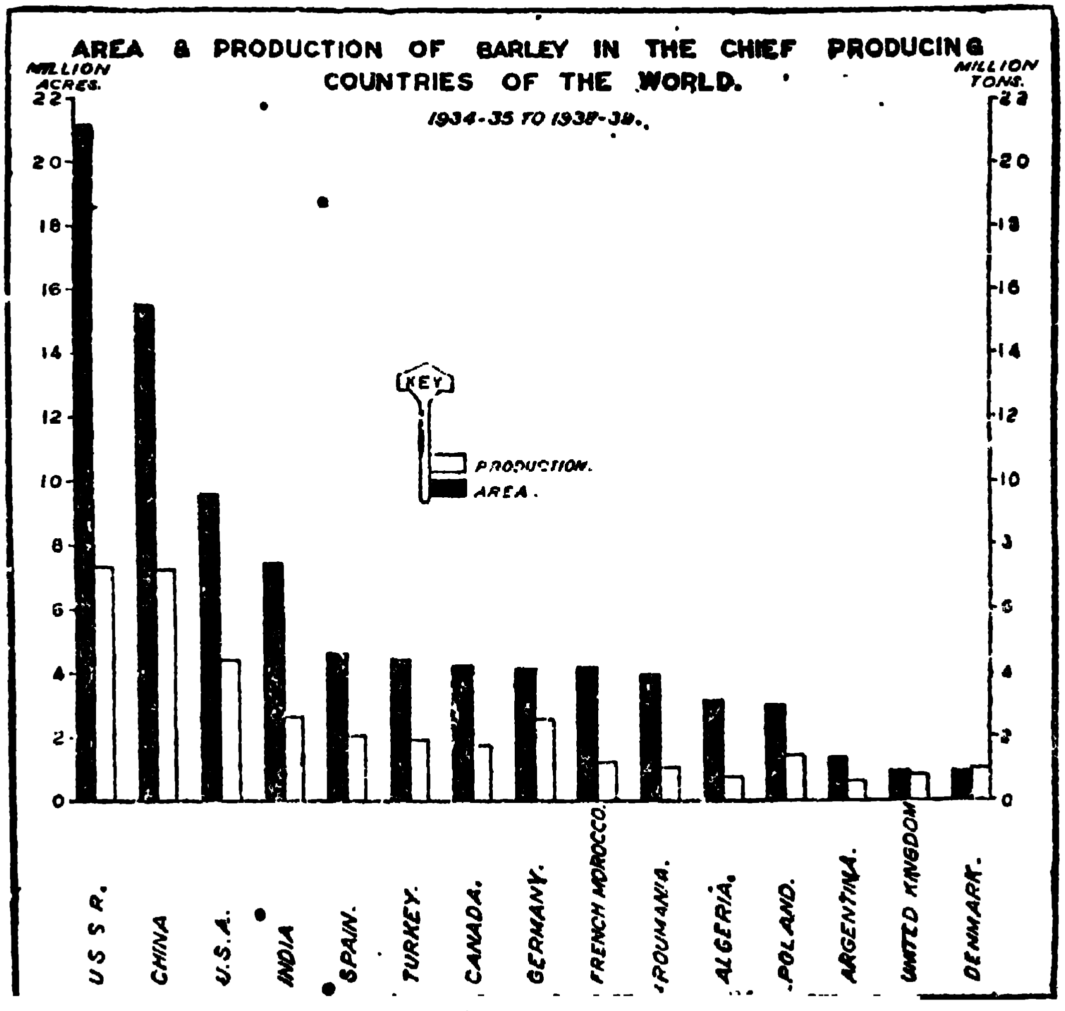

FIG. No. 12. Area and production of barley in 1938-39. Compare with the production in 1952.

Barley is grown in every province of Canada, but Manitoba and Ontario are the leaders.

Barley is exported from Rumania, U.S.A., U.S.S.R., Argentina, Poland, Canada and Iraq.

The principal importing countries are U. K., Germany, Holland, Belgium and France. The principal features of the British Empire trade in barley are exports from Canada and imports into U. K.

Oats :—It is the largest cereal crop of the world, but the grain is usually grown for home consumption and is less important in commerce than wheat. Though it is chiefly used as food for cattle and horses, it is also used for human consumption.

Oats thrive well in a cool, moist climate and are, therefore, grown in the northern parts of Europe and North America. The annual production is approximately equal to that of wheat.

WORLD PRODUCTION OF OATS BY LEADING COUNTRIES

1944-46

	Million bushels	Per cent
U.S.A. ...	... 1401·0	33·3
Germany ...	... 400·0 (1936)	—
Canada ...	... 427·1	10·2
France ...	... 207·8	4·9
U. K. ...	... 224·3	5·3
All others ...	... 1598·6	46·3
	4165·0	100·0

The world production of oats in 1950-51 was 50·1 million metric tons compared with 45 millions in 1938.

U. S. A. and Russia produce about half the world's oats. The international trade in oats is extremely small as the chief producers (with the exception of Argentina and Chile) grow it mainly for home consumption. Nevertheless, in recent years Germany and Russia and in some years the U. S. A., Canada and the Danubian countries have placed considerable quantities in the foreign markets. The chief importing countries are U.K., Italy, Switzerland, Belgium, Holland, France and Denmark.

Rice :—It forms the principal food of one-half of the population of the world. A kind of distilled liquor in India and a number of intoxicating drinks in China and Japan are also made of it. Sandals, hats and various other articles are made from the straw ; the husk is used for filling mattresses and in packing goods. It is also mixed with cement for building *sound-proof* walls.

Rice is grown on a variety of soils, but a free loam allowing root development with a heavy clay sub-soil to retain water is the most productive. It thrives in regions of high temperature and heavy rainfall. During the growing season, temperature should not be less than 75 degrees. It is seldom raised where the annual rainfall is less than 45 inches. It demands swamp conditions and during a considerable part of its growth it must be flooded. Level lands, especially of the alluvial soils of the river valleys and deltas, are, therefore, essential for rice cultivation.

Rice may be grouped into two general classes—"hill rice" and "swamp rice". 'Hill rice' requires much less water than 'swamp rice', being frequently grown without irrigation where rainfall is abundant. 'Swamp rice' requires frequent flooding, and must be raised on level ground suitable for irrigation. The yield of 'hill rice' per acre is normally less than one-half of that of 'swamp rice' and so it is much less cultivated.

The upland or 'hill rice' is raised largely by the primitive peoples of the Malaya Peninsula and near-by islands, of tropical America and Equatorial Africa. The great monsoon regions of southern and eastern Asia are favourable to the raising of low-land or 'swamp rice'.

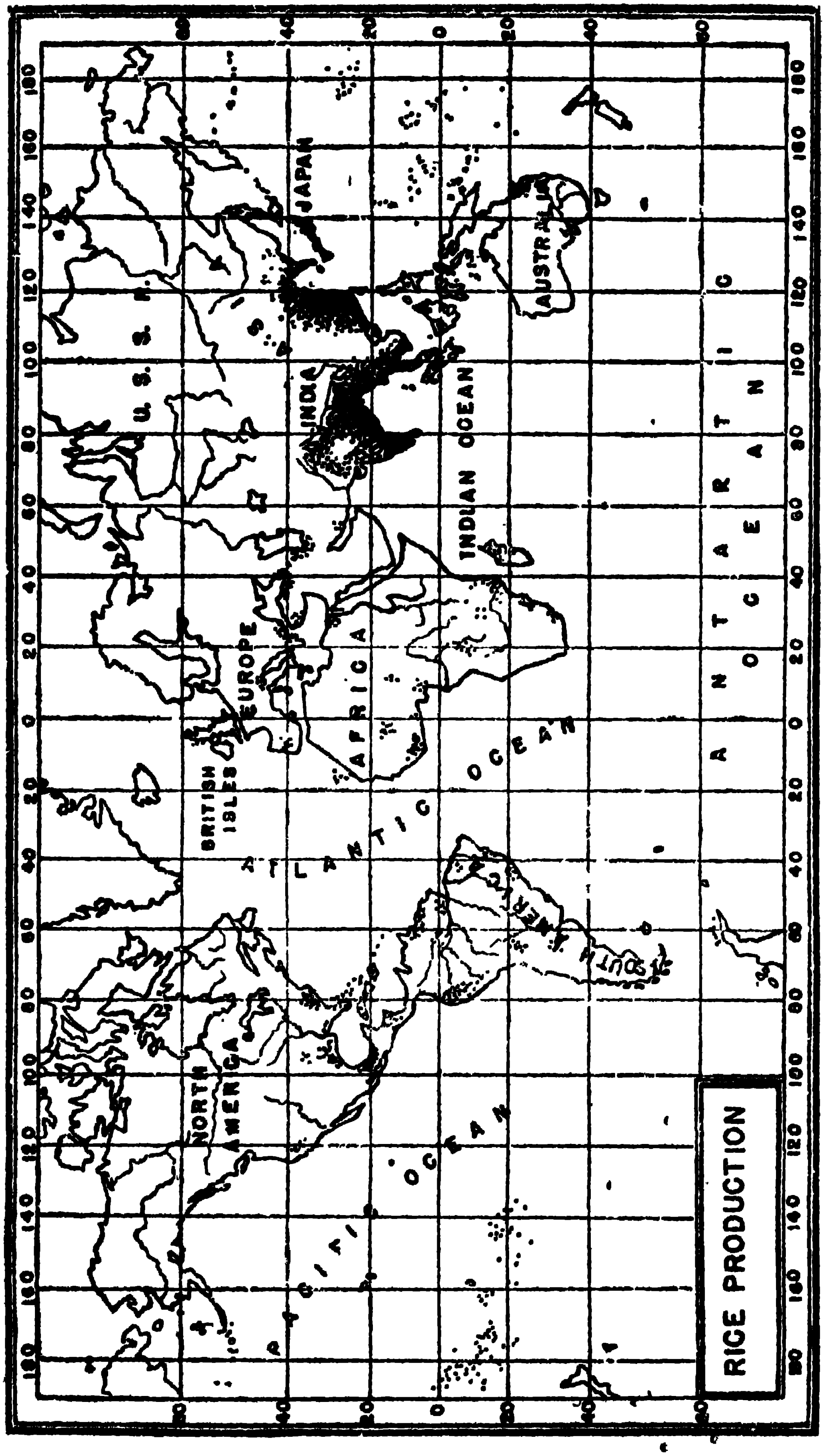

FIG. No. 13. Distribution of rice production. Note the concentration of cultivation in South-East Asia.

RICE : AREA AND PRODUCTION IN PRINCIPAL COUNTRIES

Countries	Area ('000 hectares)		Production ('000 metric tons)	
	1934-38	1950	1934-38	1950
U.S.A.	387	651	956	1,722
Brazil	956	1,820	1,365	2,995
Burma	4,931	3,986	6,791	5,440
China (22 Provinces)	19,771	19,000	50,065	—
Formosa	666	770	1,642	1,740
India	22,307	28,564	29,645	32,000
Indo-China	5,590	—	6,498	—
Java and Madura	3,843	—	6,081	—
Japan	3,169	3,215	11,501	12,005
South Korea	1,216	—	2,726	2,935
Pakistan	7,562	9,036	11,169	12,500
Philippines	1,990	2,258	2,179	2,795
Thailand	3,370	4,720	4,357	6,018
World Total (excluding U.S.S.R.)	84,400	93,500	149,300	158,800

Rice is chiefly produced in India, China, Burma, Malaya, Ceylon, Indonesia, Indo-China, Thailand, Korea, Formosa, Japan and Philippines. There is also a little production in Egypt, Italy, Spain, U.S.A. and Brazil. Owing to physical limitations Europe lags far behind Asia in rice production. Only in the warm, moist lowlands of the Mediterranean are conditions suitable for the cultivation of rice, and even there irrigation is necessary. The share of Italy in the world production of rice is insignificant ; but she maintains a very high yield per acre. Rice in Italy is grown in the valleys of the northern provinces of Piedmont, Lombardy, Venetia, Emilia and Tuscany.

India and China are the world's greatest producers of rice. The output is generally high in all the Asian monsoon areas including Japan, Indo-China, Indonesia, Thailand, Korea and

Eastern Pakistan. In 1948, the total production of paddy rice in Asia was 134 million tons.

In recent years rice has become an important crop in U.S.S.R. where about 0·5 million acres are now under its cultivation in Azerbaizan, North Caucasus, Kazak and the Far East. The average yield of rice per acre is about 42 bushels.

The Yield of Rice per Acre Varies from Area to Area

(lbs. per acre)

Area	1936-37	1946-47	Area	1936-37	1946-47
India	862	771	Thailand	949	756
China	1655	1549	Italy	2940	2431
Japan	2454	2030	U.S.A.	1485	1334
Burma	918	624	Egypt	2030	2040

The enormous home consumption of rice in India, China, Japan, Eastern Pakistan, Java and the Philippines prevents these countries from having a surplus of rice for export. The surplus to the world market comes from the less densely-populated sections of Burma, Thailand and Indo-China.

Rice : International Trade

(in thousands of metric tons)

Country	1949	1950	Country	1949	1950
Exports :			*Imports* :		
Thailand	1,215	1,480	India	801	344
Burma	1,194	1,198	Malaya	503	495
United States	516	492	Ceylon	403	452
Egypt	339	173	Indonesia	276	333
Italy	158	224	Cuba	271	307
Indo-China	105	121	Japan	136	596
Other countries	225	258	Other countries	1,130	1,419
Total	3,752	3,946	Total	3,520	3,946

Owing to devastation caused by the World War II, many of the Asiatic countries are not yet in a position to export rice in any appreciable quantity. Political disturbances in Burma and

Indo-China have slowed down the restoration of abandoned land to cultivation. Generally they have retarded recovery in production and export. Conditions for an expansion of production are comparatively favourable in Siam.

The principal importers of rice are India, Japan, Malaya, Ceylon, France, China, Indonesia and Cuba.

The rice problem today is two-fold. *The short-term problem* is to speed up the output of rice immediately so as to save the rice-consuming population from the persistent danger of privations and eliminate the gap between supply and demand for rice. The world production of rough rice (paddy) in 1948-49 was estimated at 145 million tons, but it was still 2·9 million tons below the pre-war average. The gap is really a wide one if we take into consideration the increase of population in the meantime in many rice-consuming areas. Population in the rice-eating areas increased by nearly 100,000,000 in the decade 1939-48. These increased consumption-requirements are 10 per cent over the pre-war average. The *long-term problem* is to secure a balance between a swiftly-rising population curve and a more or less stationary output level.

The International Rice Conference has been set up in Asia consisting of rice producing and consuming countries of the world to deal with problems concerning rice. The organisation has undertaken the work of control of prices and stocks and the task of international distribution.

Maize :—Maize is a native crop of South America and is one of the most valuable food plants of the world. It is largely employed in distilleries and in the manufacture of starch and glucose. Its peculiarly high fattening properties and its prolific yield have caused its large employment in the rearing and fattening of live-stock. Maize is also an important food grain for man. Maize is made into various forms of food for human consumption—for example, maizena and cornflour.

Maize requires higher temperature and much more summer rain than wheat. The soil should be rich and well drained. Much sunshine is beneficial and frost is harmful. Very little maize is grown in areas having a rainfall of less than 8 inches and most of the maize is grown in regions with an annual rainfall of at least 20 inches.

U.S.A. raises four-fifths of the corn produced in the world. The other important producers are Argentina, Russia, Rumania, Brazil, Yugoslavia, India, Mexico and Italy.

Both in production and export, the U.S.A. is easily the leading country in the world. It is mainly grown as an animal

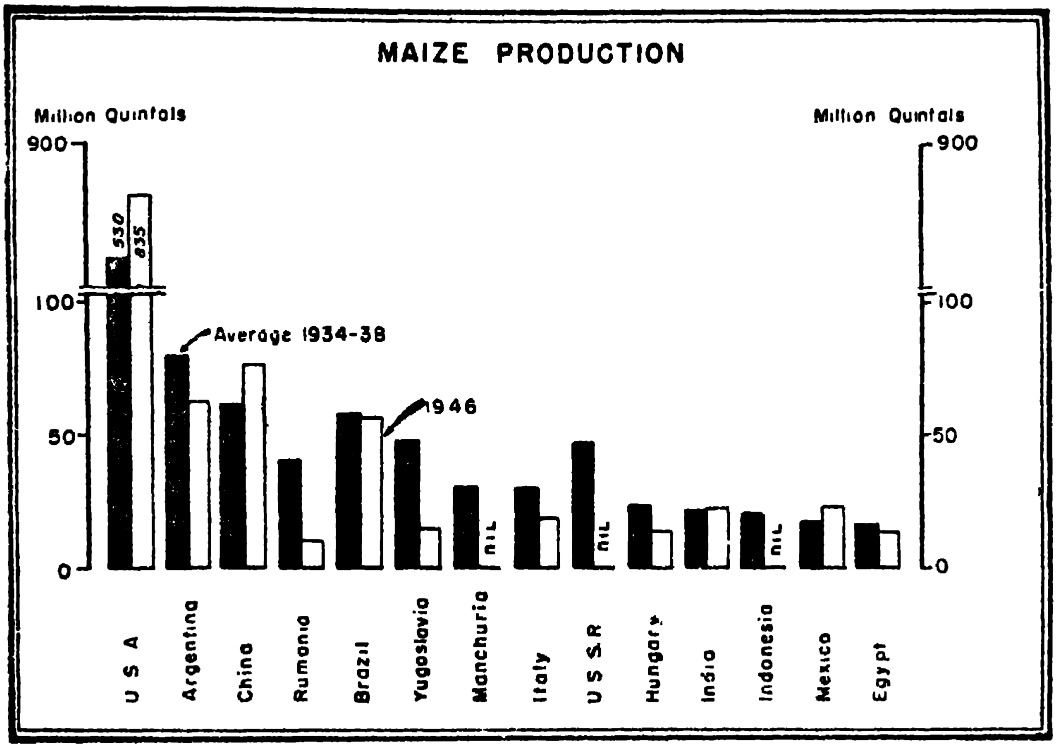

FIG. No. 14.

food in Missouri, Indiana, Nebraska and Ohio. The entire meat-packing industry of the country is concentrated in these areas with Chicago, St. Louis, Indianapolis and Cincinnati as the chief centres. Yields in the United States are increasing because of the introduction of high yielding hybrid corns. The second largest producer of maize is Argentina. In South Africa, the production of maize is an industry of very great importance and there has been a rapid rise in output during the past forty years. In India the production of maize for food is quite considerable.

MAIZE : ACREAGE AND PRODUCTION

Countries	Area ('000 hectares) 1934-38	Area ('000 hectares) 1949	Production ('000 metric tons) 1934-38	Production ('000 metric tons) 1949
Hungary	1,156	—	2,306	—
Italy	1,458	1,238	3,000	2,202
Rumania	3,879	—	4,032	—
Yugoslavia	2,672	2,316	3,708	3,718
U.S.S.R.	4,348	—	4,648	—
Mexico	2,976	3,870	1,665	2,710
U.S.A.	37,831	25,100	53,066	85,790
Argentina	4,362	1,960	7,892	2,000
Brazil	4,092	4,380	5,677	5,700
China (22 Provinces) ..	4,712	5,000	6,497	6,500
Manchuria	1,329	—	2,007	—
India	3,927	3,467	1,647	2,299
Java & Madura ..	2,048	—	1,978	1,700
Egypt	649	628	1,616	1,250
World Total (excluding U.S.S.R.) ..	84,700	84,200	110,200	138,600

The chief exporting countries are the U.S.A., Argentina, Rumania, Yugoslavia and South Africa. The United Kingdom takes considerable quantities of maize from South Africa, U.S.A., Argentina and Rumania.

Millet :—It is a very important cereal crop of the monsoon region and is grown for fodder or for food.

Millet flourishes best in those hot lands where rainfall is scanty and unreliable. It can be grown without irrigation even in areas which are fairly dry. The important millet-producing countries are India, China, Japan, U.S.A., and the Sudan. There is very little trade in millet, nearly all of it being grown for local consumption. In India millet constitutes an important food crop for Madras, Bombay and Hyderabad.

Tea :—It is the name given to the dried leaves of an evergreen tree. Tea has become so universal in use among the civilised peoples that it is now looked upon more or less as a necessity. The greatest tea-drinkers are the Chinese, British, Russians, Dutch, Australians and South Americans.

Tea requires a deep fertile soil, which must be exceptionally well drained, so that there can never be stagnant water in the soil. It is, therefore, generally grown on hill-sides, although it flourishes in well-drained valleys also. High temperature is absolutely necessary in summer.

An economic factor that restricts tea-growing is the need for a large supply of cheap labour. All the picking of the leaves is done by hand and it involves a great deal of manual work. It is, therefore, grown in those sub-tropical lands which have abundant cheap labour, and in those lands it is a productive crop.)

The important tea-producing countries are China, India, Ceylon, Java and Japan. In Natal and Fiji some tea is grown. The chief exporting countries are India, Ceylon, China, Japan and Formosa.

CHIEF TEA-PRODUCING COUNTRIES

	(Million lbs.) 1948	1949-50
India	571	580
Pakistan	45	45
Ceylon	299	280
Indonesia	28	60
Africa	30	28
Japan (exports)	9	9
Formosa ,,	21	21
China ,,	39	39
Total	1,042	1,062

Although China has the largest acreage under tea, there is hardly any exportable surplus on account of heavy demand in the domestic market. India is now the leading exporter of tea in the world and contributes about 50 per cent of the world's total. Most of the tea acreage of India is in the north-eastern part of the country in Northern Bengal and in Assam. In fact, about four-fifths of the tea acreage of India is in this north-eastern area, the remaining acreage being in the southern part of the Peninsula, in the Nilgiri Hills. One special feature of the tea plantation of India is that the majority of tea plantations are in the hands of the Europeans. The large consumers of Indian tea are the United Kingdom, Russia, France, U. S. A., Canada and Australia. Eastern Pakistan has a few tea plantations in Sylhet and Chittagong.

TEA : EXPORTS OF MAJOR EXPORTING COUNTRIES,
1934-38, 1949 and 1950

(Thousands of metric tons)

Exporting country	1934-38	1949	1950
India ...	152	221	178
Pakistan ...		12	7
Ceylon ...	100	135	135
Indonesia ...	68	22	28
British East Africa*	7	10	13
Japan ...	18	7	7
Other countries†	52	24	23
TOTAL ...	397	432	392

Source : International Tea Committee.

London is the largest tea-distributing centre of the world and Great Britain consumes more than half of the world's imports. Russia consumes about one-quarter of the tea exported from Asia. Attempts are being made in Russia to produce tea. The total Russian production of tea is very insignificant, amounting only to about several thousand pounds, whereas the annual consumption is equal to about 3 million pounds.

After 1929 there was a great over-production in the tea-growing areas and as a result there was a heavy fall in prices ; many concerns collapsed and the industry faced precarious conditions. An international scheme was, therefore, worked out in 1932 for regulating the volume of export and cultivation of tea from 1933 (April 1) to 1938 (for five years). A second restriction scheme was put into operation on the same principles in 1938 for another five years.

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* Including Kenya, Nyasaland, Uganda and Tanganyika.
† Including exports of China.

One of the main drawbacks of the scheme of 1932 was that all the producing countries did not join in the agreement. India, Ceylon and Indonesia were parties to the scheme and they were tied as to their exportable output. In 1932 the non-participating countries shared one-sixth of the world's tea-export trade ; but in 1937 they handled more than one-fourth of the world's tea export. A new International Tea Agreement was made in 1948. At the first instance, the agreement was for a period of two years. India, Pakistan, Ceylon and Indonesia are the members of the agreement. The International Tea Market Expansion Board is carrying on vigorous campaign for tea in many countries. Over a million dollars are being spent in the United States of America annually towards tea propaganda, which is increasing the consumption of tea in that country. The International Tea Market Expansion Board is carrying on work in a variety of directions towards securing a substantial increase in tea consumption both in the U.S.A. and in Canada.

Imports of tea into the U.S.A. and Canada have greatly increased in recent years, and the figures for 1950 are placed at 110 million lbs. and 40 million lbs. respectively. The relatively high standard of living would appear to show that both the U.S.A. and Canada are capable of increasing their offtake of tea substantially, if the right type of propaganda for tea is conducted in those countries. Tea in America is, however, a highly competitive beverage: it has its rivals in coffee, cocoa and various other drinks. The *per capita* consumption of tea in the U.S.A. is very small, but it is capable of a substantial improvement, notwithstanding the existence of other competitive beverages. The principal reasons for this are that tea is still by far the cheapest beverage and that not an inconsiderable number of Americans are already strongly tea-minded. Iced tea appears to be more popular than hot tea for some un-understandable reason, and the Board conducts propaganda in favour of both iced tea and hot tea.

Production is rising steeply in all countries. The post-war boom is almost over now. The need to keep costs of production down and where necessary to improve quality is obvious.

There is consequently great demand for Indian tea. The market outlook, however, in U.S.A. and Canada is not encouraging as coffee consumption has very much increased in these two countries.

TEA : IMPORTS OF SELECTED COUNTRIES, 1950

(Thousands of metric tons)

Importing country	Exporting countries					
	British East Africa*	Ceylon	India and Pakistan	Indonesia	Other countries	Total
Australia ...	0·4	16·9	8·1	1·9	0·4	27·8
Canada ...	1·7	9·7	12·7	0·2	0·7	25·0
Egypt ...	—	9·8	3·0	2·7	0·5	16·0
Iran† ...	—	0·3	6·2	—	1·8	8·3
Ireland ...	—	0·5	9·8	0·6	—	10·9
Netherlands ...	—	0·4	0·7	7·5	0·4	9·0
Union of South Africa ...	0·6	8·1	—	0·1	0·4	9·2
United Kingdom	4·7	42·5	116·7	1·7	1·6	167·2
United States ...	1·5	20·2	18·4	4·2	7·6	52·0

Source : International Tea Committee, *Bulletin of Statistics*; figures represent gross imports of the importing countries.

Cocoa :—The cocoa tree is a native of South America. It has been transplanted to other parts of the wet equatorial region and has become a profitable plantation crop.

The cocoa tree requires constantly high temperature and an abundance of moisture. "Much moisture and deep fertile soil are essential to a good yield." A prolonged and excessive drought is very harmful and too much rain is also a disadvantage. The plant requires shade from sun and shelter from wind. Regions of equatorial climate are best suited to cocoa plantation. Gold Coast, Nigeria, Brazil, British West Indies and Ceylon are the chief producers. Thus the distribution of cocoa is limited to within 20 degrees of the equator.

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* Including Kenya, Nyasaland, Uganda and Tanganyika.

† 1950-51.

CHIEF COCOA-PRODUCING COUNTRIES

AVERAGE PRODUCTION IN METRIC QUINTALS (000 OMITTED)

	1946	1939		1946	1939
Gold Coast	1940	2,747	French Cameroons	350	237
Brazil	1402	1,100	Trinidad	54	201
Nigeria	—	695	Ecuador	192	197
French West Africa	—	518	Spanish Guiana	—	149
Dominican Republic	287	283	Venezuela	274	142

During the period 1948-49 to 1950-51 the proportion of world supplies from Gold Coast and Nigeria was 50 p.c., from Brazil 18 per cent, from French West Africa and the Cameroons 12 per cent.

The cocoa plantations are mostly managed by the Europeans, though in West Africa the natives have developed their own plantations.

Gold Coast provides about 50 per cent of the world's supply. "Having equal facilities with other producing countries as regards climate and soil, it has outstripped its competitors by its more skilful exploitation of the land, by experienced administration on the part of white men and by keeping cocoa as the only important money crop. Other factors are that the Gold Coast lies on an old established shipping route, and that the development of railways and roads has made communication between the plantations and the ports very much superior to those existing in the older producing countries such as Ecuador."

At present the U. S. A. leads the world's consumers of cocoa. Forty per cent. of the world's annual crop goes to the U. S. A., the countries of North-West Europe consuming most of the remainder. Spain is the only European country where cocoa is regarded as a necessity. Switzerland and Holland import large quantities for making chocolate.

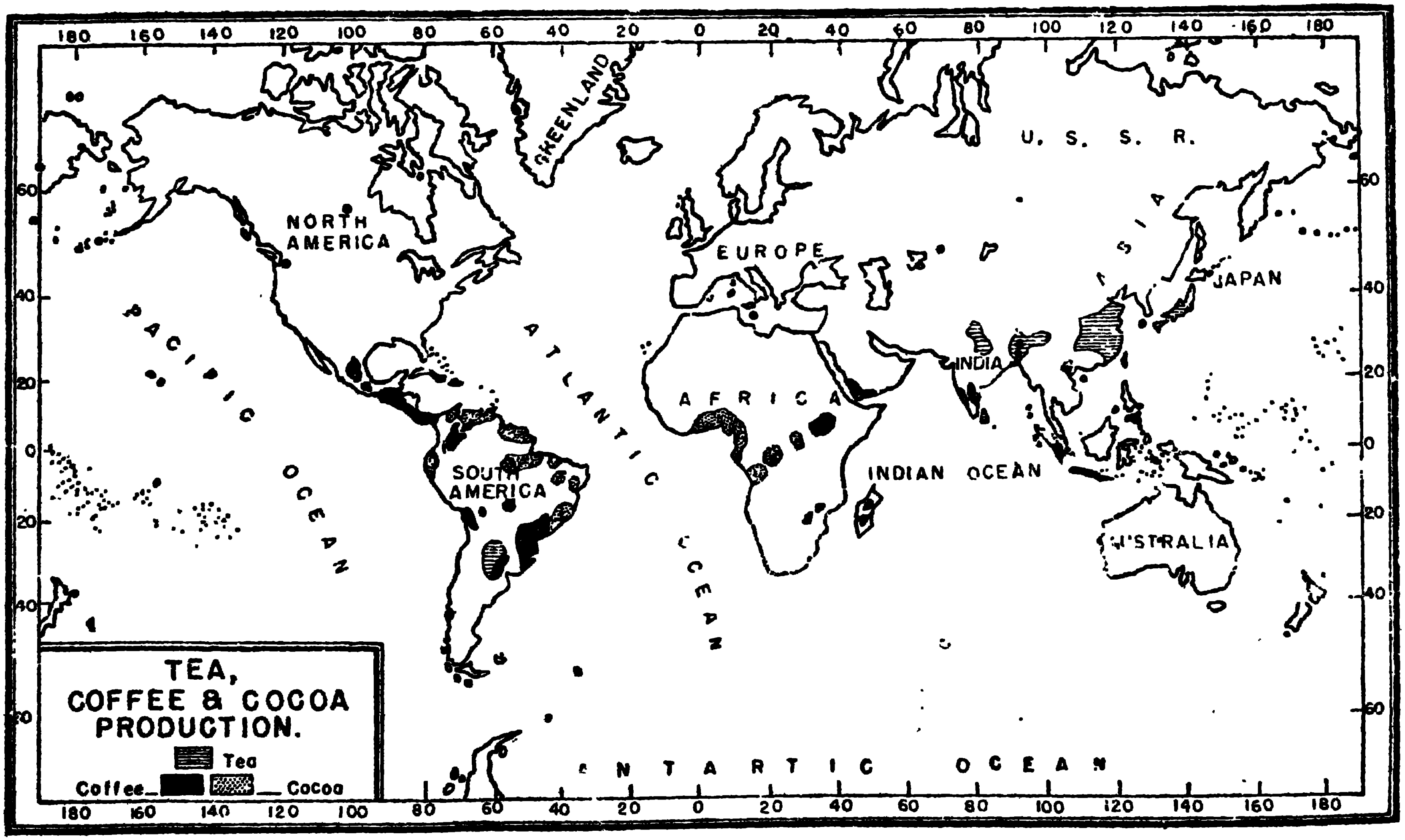

FIG. No 15. Distribution of tea, coffee and cocoa production. Note the great cocoa belt in equatorial Africa.

COCOA: IMPORTS, 1949 AND 1950

(Thousands of metric tons)

Destination	Exporting countries: Brazil 1949	1950	British West Africa* 1949	1950	Other countries 1949	1950	Total 1949	1950
Canada	1·4	2·9	14·8	12·6	2·2	2·5	18·5	17·9
Germany, western ...	0·2	1·5	13·3	39·6	4·9	13·8	18·3	55·0
Netherlands ...	6·5	7·4	22·9	31·6	10·0	27·0	39·4	66·0
United Kingdom ...	4·4	24·6	139·3	94·9	5·3	13·0	149·1	132·4
United States ...	90·8	73·6	132·7	143·4	61·7	82·0	285·2	298·9

Source: Compiled from official trade statistics of the importing countries.

Coffee:—It is grown in many countries and has become a regular commodity of consumption in several parts of the world. Coffee plant requires a rich well-drained soil, a warm climate and a moderate supply of moisture ; so plantations are generally limited to the tropics. Although a tropical plant, it does not require a high temperature. Above 86°F the yield suffers while it cannot stand for long temperature below. The plant, when young, must be sheltered from strong sunshine and with this end in view banana and other shady trees are planted on coffee estates. As the soil must be rich and well-drained, the plant grows usually on hills and highlands where the streams have rapid falls to give the necessary drainage.† Three to five years are required for the plant to mature after which it bears fruit for some thirty years. The pulp of the fruit is removed to obtain cherry-stones inside. The inner kernels of these cherry-stones yield coffee.

Coffee is a tropical product and is grown almost exclusively for export. One economic factor on which large output depends in most lands is the supply of abundant cheap labour, because a large amount of hand-work has to be performed in preparing the product for the market.

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* Gold Coast and Nigeria.

† Rainfall is of fundamental importance to coffee plants. In the Equatorial Regions it usually rains throughout the year but towards the Tropics dry seasons are experienced whose duration varies according to altitudes. The minimum rainfall required by the coffee plant from germination of the seeds up to the ripening of the cherries is from 50 to 60 inches. When it does not attain this minimum, it can be supplemented by irrigation. If there is too much rain, drainage is necessary.

The important coffee-producing countries are Brazil, West Indies, Mexico, Central America, Venezuela, Columbia, Andean Highlands, India (South), Ceylon, Indonesia and Arabia. For many reasons coffee yields vary from country to country. The chief factors are (*a*) quality of the soil, (*b*) climatic conditions, (*c*) species, varieties and age of the coffee plant, (*d*) cultivation methods, from selection of seed to pruning and harvesting and (*e*) method of commercial preparation.

AVERAGE COFFEE YIELDS PER ACRE.*

(lbs. per acre)

	Average 1938-39		Average 1938-39
Brazil	365·8	Kenya	472·8
Columbia	562·1	Dominican R.	356·9
Indonesia	472·8	Madagascar	232
Salvador	553	Belgian Congo	276·6
Venezuela	517	Angola	410·4
Guatemala	446·1	India	196·3
Mexico	419·3	Puerto Rico	116·0
Cuba	446·1		

Arabia is the home of Moka coffee, celebrated throughout the world for its excellent aroma and taste. Coffee was first introduced to Arabia towards the end of the seventeenth century from Ethiopia. As the climate of Arabia is extremely hot and dry, the coffee crops are localised in Yemen. Yemen, is, on the whole, mountainous, and the climate is temperate in the interior. Coffee is cultivated in the mountainous zones of Yemen at heights between 2,000 and 6,500 feet. The only species cultivated is *coffee arabica* which is called Moka. Though the soil and climatic conditions are excellent there, inadequate irrigation, poor roads, high taxes and bad government have kept the yield per acre low. Consequently the export is small.

Brazil alone grows more than half of the world's coffee and the prosperity of the country depends on the coffee trade. The state of Sao Paulo, with its rich volcanic soils, is particularly suited to coffee-growing. The other areas are Rio de Janeiro, Espirito, and Minas Gerais. Sao Paulo is the main coffee-producing centre not only in Brazil but also in the whole world. The crop was first introduced in 1800, though the real progress started from the second half of the nineteenth century. The *great interior plateau* of the Sao Paulo state is the most extensive and the best adapted to the cultivation of coffee. The danger of depending on one crop for the economic welfare of the people of a country is best seen from the Brazilian coffee industry. In 1897 there was a great over-production of coffee in Brazil and in consequence the prices fell heavily, bringing miseries in its wake to innumerable Brazilian coffee-growers. In its effort to restore prices the Brazilian Government resorted to valorization, which consisted in buying up large stocks of coffee, holding them until the prices improved and then releasing them gradually. Since then valorization measures have become a regular part of the Brazilian coffee-marketing programme.

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* The World's Coffee (1947) Bureau of FAO in Rome.

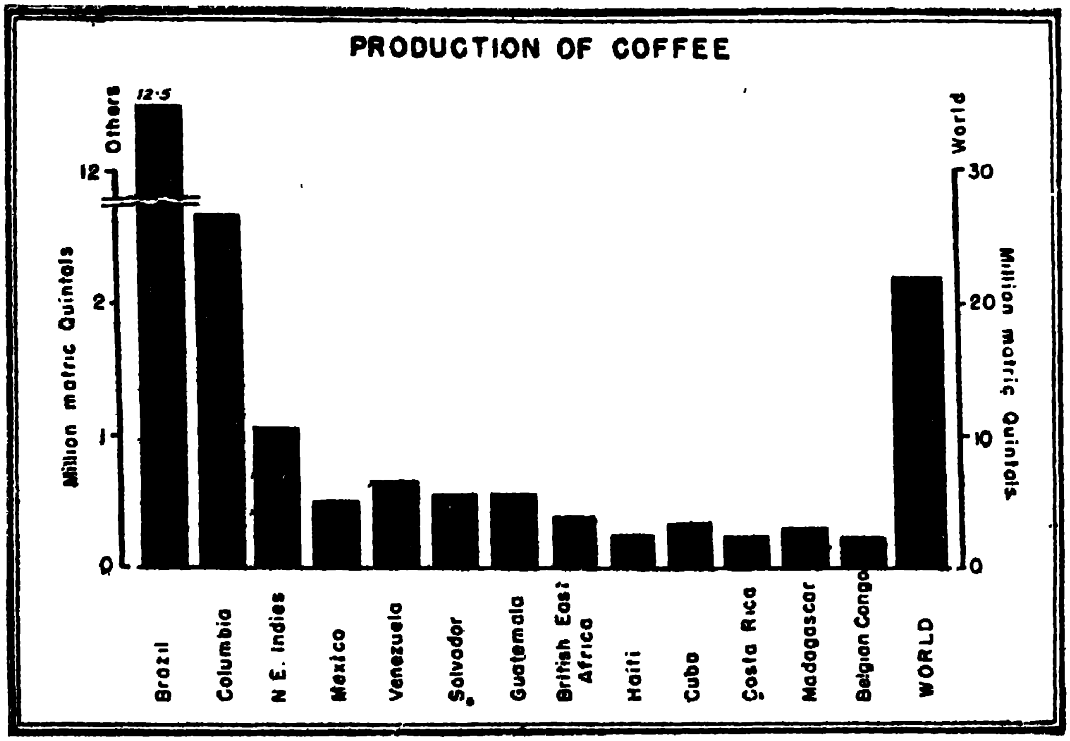

FIG. No. 16. Coffee production in 1940.

In India the principal coffee regions are Mysore, Madras, Coorg, Cochin, Travancore and Bombay. In some of the growing areas coffee has been replaced by tea. Indian coffee is exported to the United Kingdom and France.

Coffee ranks first in value among the exports of many Latin American countries, and it is the principal commodity imported into the United States. Coffee exports accounted for more than half of the value of total 1950 exports from Brazil (64 per cent), Colombia (78 per cent), Costa Rica (52 per cent), El Salvador (89 per cent), Guatemala (78 per cent), Haiti (53 per cent) and Nicaragua (65 per cent), and was the most valuable single product exported from several others (Angola, 34 per cent; Ecuador, 30 per cent; Uganda, 28 per cent). In international trade coffee has an important place. In the "enjoyment goods" trade, it holds the first place, above tea, tobacco and alcoholic beverages. Between the two World Wars, the cultivation and marketing of coffee were very much upset by the crisis of over-production. Various efforts were made to combat such crises. In 1940 an Inter-American *Coffee Agreement* was made which assured the American coffee-growing countries a regular and equitable sale in the U.S. market of a good part of their yearly exportable surpluses. In 1943 the Inter-American Coffee Board recommended that "member governments take measures to popularise the consumption of coffee among people suffering from the privations of war". In 1946, the Board examined the world coffee situation to attain some sort of international co-operation. The coffee industry was very much upset during the World War II as about two and a half million acres went out of production in Brazil, and the Japanese occupied the Netherland Indies and man-power was lost in many coffee-growing countries especially in Africa and Oceania. These problems are no doubt over now but there are other handicaps. The only obstacles which are now hindering the expansion of coffee are the following*:

(*a*) Lower standard of living and less purchasing power among millions of consumers;

(*b*) shortage of shipping and relatively high freight charges;

(*c*) instability of money and rates of exchange, lack of financial balance in most European countries;

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* The World's Coffee (International Institute of Agriculture) 1947.

(*d*) the restrictive policy of import quotas, customs and domestic taxes which hit severely the importation, distribution and consumption of coffee, especially in Europe ;

(*e*) competition from other beverages, especially tea ;

(*f*) the enormous increase in substitutes owing to their relatively low price.

COFFEE : ACREAGE AND PRODUCTION

Country	Area ('000 hectares)		Production ('000 metric tons)	
	1934-38	1949	1934-38	1949
Brazil	3480	2793	1446·1	1068·0
Colombia	358	—	251·2	344·5
India	63	89	16·3	22·7
Angola	36	127	16·6	36·6
F. West Africa ..	89	160	7·9	36·0
World Total ..	—	—	2430	2200

The world production of coffee in 1950-51 was estimated at 2·1 million tons.

Tobacco :—It is exceedingly important in international trade. Tobacco is prepared from the leaves of plants which are native to tropical America. But although it is a tropical plant, it has a very wide range, being grown in all parts of the world. It is raised in the equatorial region, and also as far as Canada, Scotland and Northern Poland.

Tobacco plant thrives in light soil that is rich in lime, humus and potash. It is sensitive to frost. As regards economic factors, a considerable amount of cheap labour is necessary for the cultivation and preparation of tobacco.

The leading producers of tobacco are the U.S.A., India, China, Russia and Japan ; the Philippines, Indonesia, Brazil, Pakistan and most of the countries of Central and Western Europe also account for large quantities. The leading exporters are the U.S.A., Sumatra, Cuba, Brazil, Bulgaria and Turkey.

Western Europe is the chief importing area, specially U.K., Germany and France.

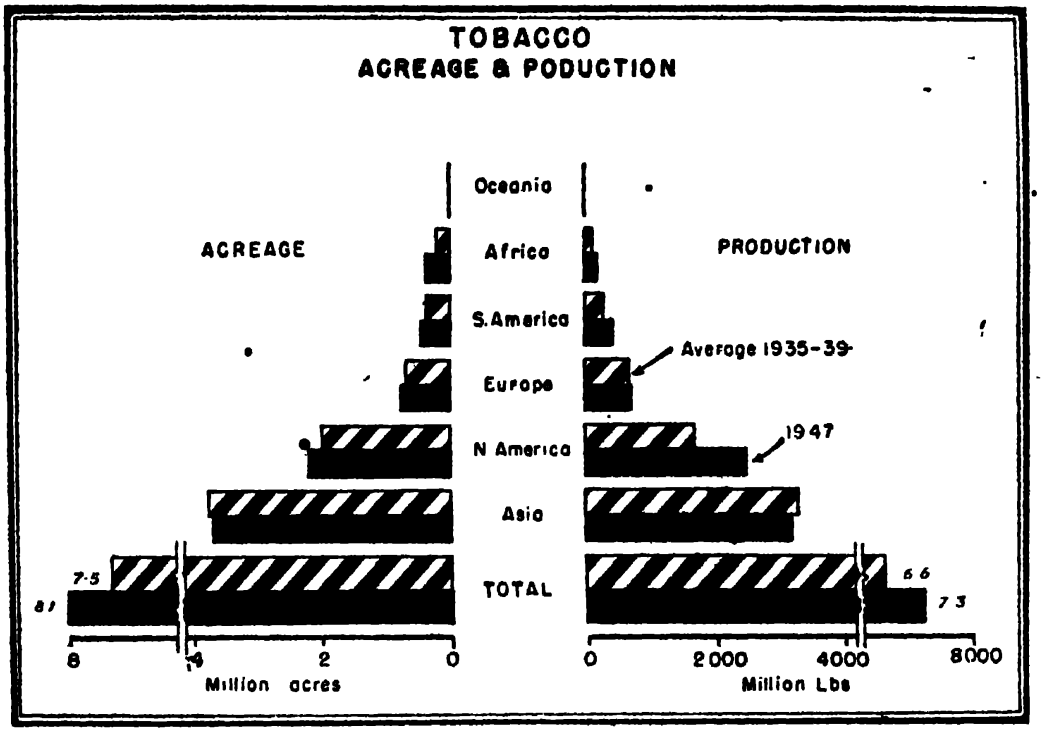

Fig. No. 17. World Tobacco output by continents.

Tobacco: Production 1949 to 1951

(Thousands of metric tons)

Country	1949	1950	1951
World ..	3,030·0	3,100·0	
Brazil	115·0	106·4	110·0
Canada	63·4	54·6	68·5
Cuba	42·5	34·5	—
Greece	46·0	58·4	63·0
India	257·1	249·9	—
Pakistan	66·8	—	—
Indonesia	—	—	—
Southern Rhodesia ..	48·5	40·1	50·0
Turkey	99·4	85·0	89·8
United States	894·7	921·9	1,010·0

U.S.A. is a great producer of tobacco. In 1943 the U.S.A. raised 1,372 million lbs. of tobacco. The chief tobacco-growing

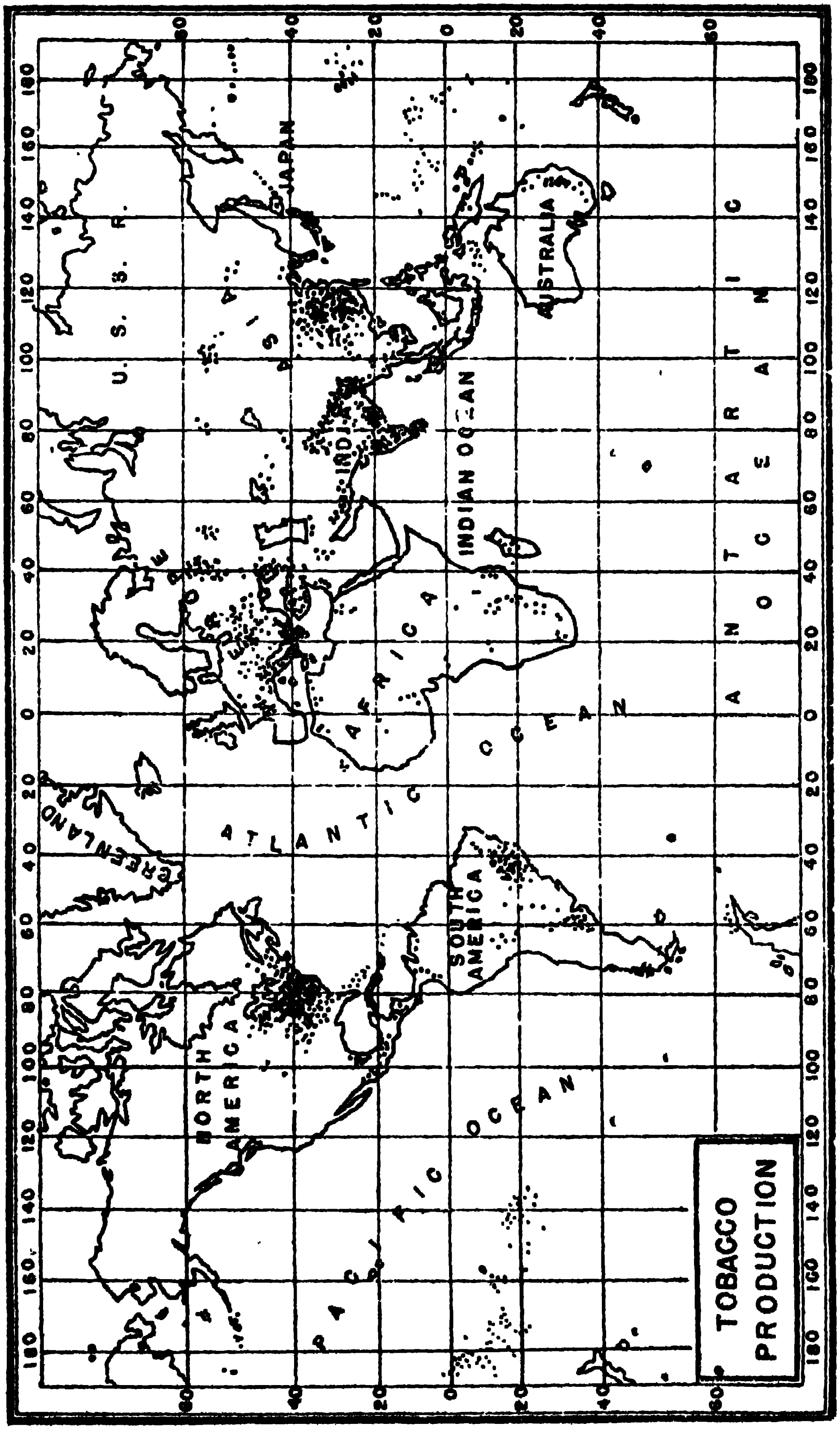

FIG. No. 18. Distribution of tobacco production. Note the wide climatic range over which tobacco is cultivated.

States are North Carolina (547 million lbs.), Kentucky, Virginia, Tennessee, South Carolina, Georgia, Pennsylvania, Wisconsin and Ohio. Coloured labour is employed in the plantations because it is very cheap. The important tobacco centres are Louisville, Richmond, Petersberg and Winston-Salem.

Cuba tobacco is famous throughout the world for its fine flavour, being much prized for cigar: Havana is the great cigar-manufacturing centre of the island.

A considerable quantity of tobacco is grown in Java, Sumatra and the other lands of Indonesia, where the plantations are mostly managed by Europeans with Chinese labour. In recent years splendid progress has been made in Indonesia, which has become second only to the U.S.A. as a tobacco-exporter.

Tobacco is one of the most valuable crops grown in India, which produces about as much tobacco as the U.S.A. Pakistan produces about one-third of Indian production of tobacco. Brazil is the third tobacco-exporter in the world. Bahia is the principal port of Brazil which does considerable trade in tobacco. In Europe tobacco is grown extensively in Hungary, Bulgaria, Yugoslavia and Greece.

In Great Britain supplies of tobacco are drawn from the U. S. A., India, Sumatra and the Philippines.

Tobacco Exports of Major Exporting Countries, 1949 to 1951

(Thousands of metric tons)

Country	1949	1950
World	570·0	560·0
Brazil	27·2	35·8
Canada	7·3	12·1
Cuba	12·0	12·4
Greece	27·7	25·5
India	32·8	45·1
Pakistan	—	—
Indonesia	8·3	12·4
Southern Rhodesia	30·8	40·5
Turkey	77·6	50·7
United States	226·0	216·0

Sugar :—It is probably the most widely used of all food products. Nearly all sugar is obtained from the juice of two plants, the sugar-cane which is essentially tropical or sub-tropical, and the sugar-beet which is temperate.

Sugar-cane belongs to the tropical and sub-tropical regions and it requires for its successful cultivation a high temperature and ample rainfall. The soil must be well drained and should have salt and lime in it ; so it grows best along the sea-coast. The plant requires little attention during its growth but an abundance of cheap labour is necessary in harvesting the crop and preparing the material for export.

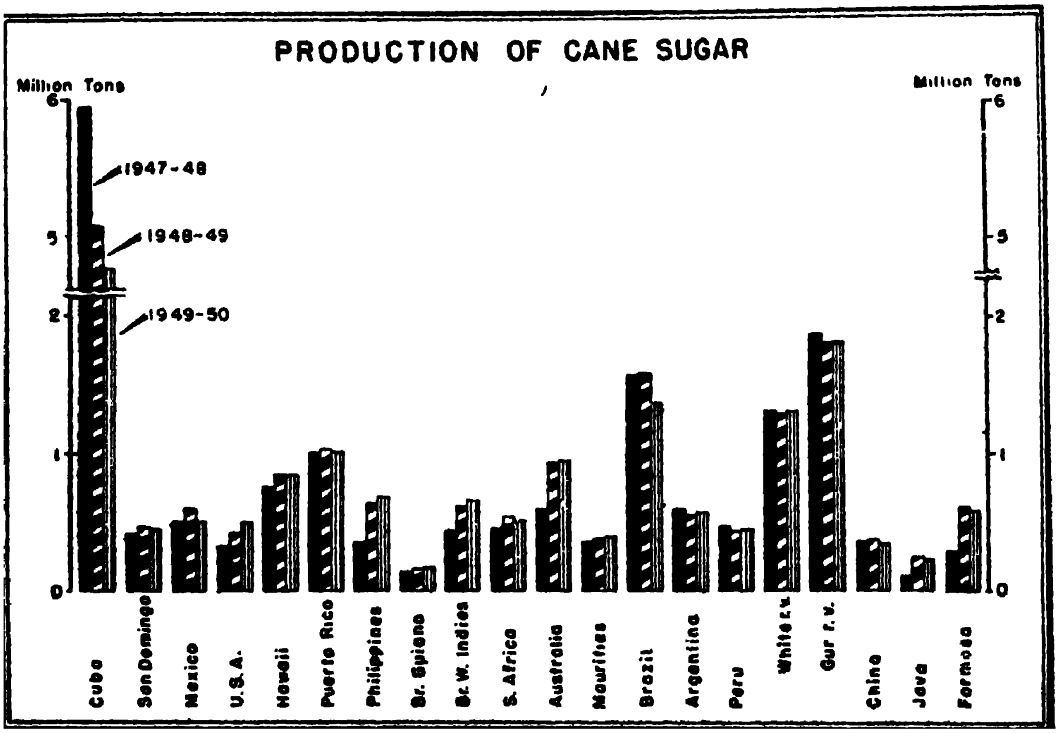

FIG. NO. 19.

The important sugar-cane-producing countries are India, Cuba, Indonesia, Brazil, Hawaii, Mauritius, the Philippine Islands, Dominica, British Guiana, Formosa, Porto Rico and Australia. The chief importers are the U.S.A. and the United Kingdom. Although India is one of the greatest producers of cane-sugar, it is also the third greatest importer.

Before 1938 the world problem of sugar was that of over-production. The International Sugar Council was established in

1937 to overcome the evils of over-production.* Almost all the chief sugar-producing countries (accounting for 90 per cent. of world sugar) joined the council in order to establish orderly relationship between supply and demand and to secure a fair return for efficient sugar growers and producers. The council has the right to fix the annual export quota. At present, however, supply is short of demand because the major sugar areas like the Philippines, Java, Formosa and Ukraine have not yet been able to bring back the pre-war level of production. The World War II shattered the economic structure of these countries to a great extent.

Sugar constitutes the chief source of wealth to Cuba. Cuba supplies one-eighth of the world's sugar, both cane and beet. This means the development of enormous plantations and an immense investment of capital, binding up the prosperity and well-being of the people to a single crop. During the World War II, the production of sugar tremendously increased in Cuba. The production rose from 2·7 million tons in 1941 to 6·4 million tons in 1947. The international sugar position at present is bound up with the situation in Cuba.

India ranks first in sugar-cane production. Although the crop is grown throughout Northern India, the chief area of production embraces the middle and the upper regions of the Gangetic plain. The production of sugar in Pakistan is 25,000 tons.

The sugar industry has an important place in the national economy of Java. High profits arising out of the industry have induced the growers to cultivate sugar extensively. Its cultivation largely replaced rice. The Government takes strict measures to see that not more than a third of the land in any given area is devoted to sugat-production. Java depends on foreign markets for the sale of four-fifths of its sugar production.

Mauritius is a large exporter of sugar. The people of the island virtually depend on sugar. The efficiency and quantity of sugar-cane have been increased because of irrigation. The United Kingdom is the largest individual buyer.

Beet sugar forms about one-third of the total sugar produced in the world. Sugar beet is a temperate crop and requires well-drained fertile loamy soil and is such an exhausting crop that heavy manuring is constantly necessary. Sugar beets require a growing period of 160 to 170 days. The number of sunny days has an important effect on the sugar contents of the beet. Sugar beet seems to thrive best in a region with a continental type of climate, provided the rainfall is not too small.

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* This may be regarded as successor to the private so-called Chadbourne Agreement which succumbed owing to its imperfections.

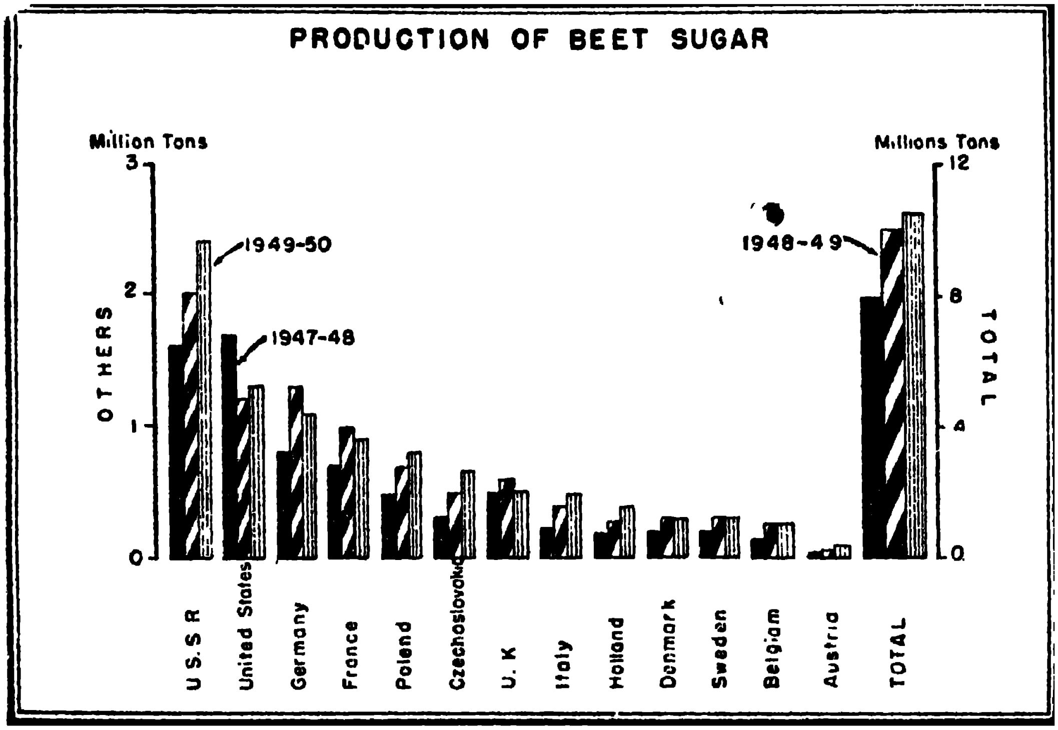

FIG. 20.

The chief producers are Germany, U. S. S. R., France, U. S. A., Czechoslovakia and Poland. The important exporters are Germany, Czechoslovakia and Poland. The United States is the only country where sugar-cane and sugar-beet are produced within the same political frontiers, and there most of the cane produced is not used for making sugar. Also the two regions of production in the United States are small and remote from one another. The chief districts for beet production are the irrigated valleys of the Great plains from Montana to South Colorado, Idaho, Utah and the coastal plain of California.

Soviet Union is the leading sugar-beet-producing country in the world. It has about 3 million acres under sugar beet cultivation which corresponds to 35 p.c. of the world's sown area of sugar beets. It raises about one-fourth of the world's total supply of beet sugar. Trans-Caucasia, West Siberia and south and central European Russia are the cultivated areas. Recently its cultivation has extended to Kazak, Khirgizia and the Far East. The average yield of sugar-beet in U. S. S. R. is about 7 tons per acre.

Not many years ago beet-sugar controlled the world market ; but, to-day, it is the privilege of cane-sugar to supply more than two-thirds of the total requirement of sugar. Sugar-cane has certain advantages over sugar-beet inasmuch as its cultivation is easier and the yield per acre is richer. Moreover, it is grown in tropical and sub-tropical areas where labour is very cheap. But there are certain advantages on the side of beet production also. Sugar-beet is grown where the population is dense, capital is easily obtained and good machinery can easily be used. Furthermore, the refuse materials and by-products have great commercial value.

PRODUCTION OF SUGAR

(In thousand tons)

	1947-48	1948-49	1949-50
BEET SUGAR :			
Germany	770	1,283	1,110
Czechoslovakia	345	625	700
Poland	541	682	300
Austria	36	48	80
France	650	950	925
Belgium	136	255	250
Holland	217	280	380
Denmark	221	260	300
Sweden	240	287	275
Italy	235	448	460
United Kingdom	463	615	475
U.S.S.R.	1,595	1,950	2,350
Total Europe (including others)	6,116	8,732	9,072
United States	1,684	1,180	1,300
Total Beet (including other countries)	7,945	10,065	10,550

	1947-48	1948-49	1949-50
CANE SUGAR :			
Cuba	5,960	5,146	4,800
San Domingo	415	460	450
Mexico	610	700	625
United States	336	430	500
Hawaii	745	850	850
Puerto Rico	988	1,140	1,100
Philippines	357	645	700
British Guiana	164	184	190
British West Indies ..	440	615	650
South Africa	457	544	520
Australia	605	944	950
Mauritius	345	390	400
Brazil	1,535	1,550	1,350
Argentina	597	557	575
Peru	465	440	450
India and Pakistan :			
Whites, r.v.	1,305	1,275	1,300
Gur, r.v.	1,855	1,800	1,800
China	350	380	350
Java	100	250	250
Formosa	287	620	600
Total Cane (including others)	19,067	20,064	19,552

At present the production of sugar-beet is continued for economic and political reasons. Many countries of the temperate zone (like Germany and France) consider it unsafe to depend on the tropical countries for the supply of sugar. Besides, the development of beet-sugar industry provides employment for many at home. They have, therefore, encouraged the growth of sugar-beet by subsidies or bounties and protective tariffs. In normal time, Germany, Russia and France are at least self-sufficient in sugar, but not so are Great Britain, U.S.A., Italy and Japan.

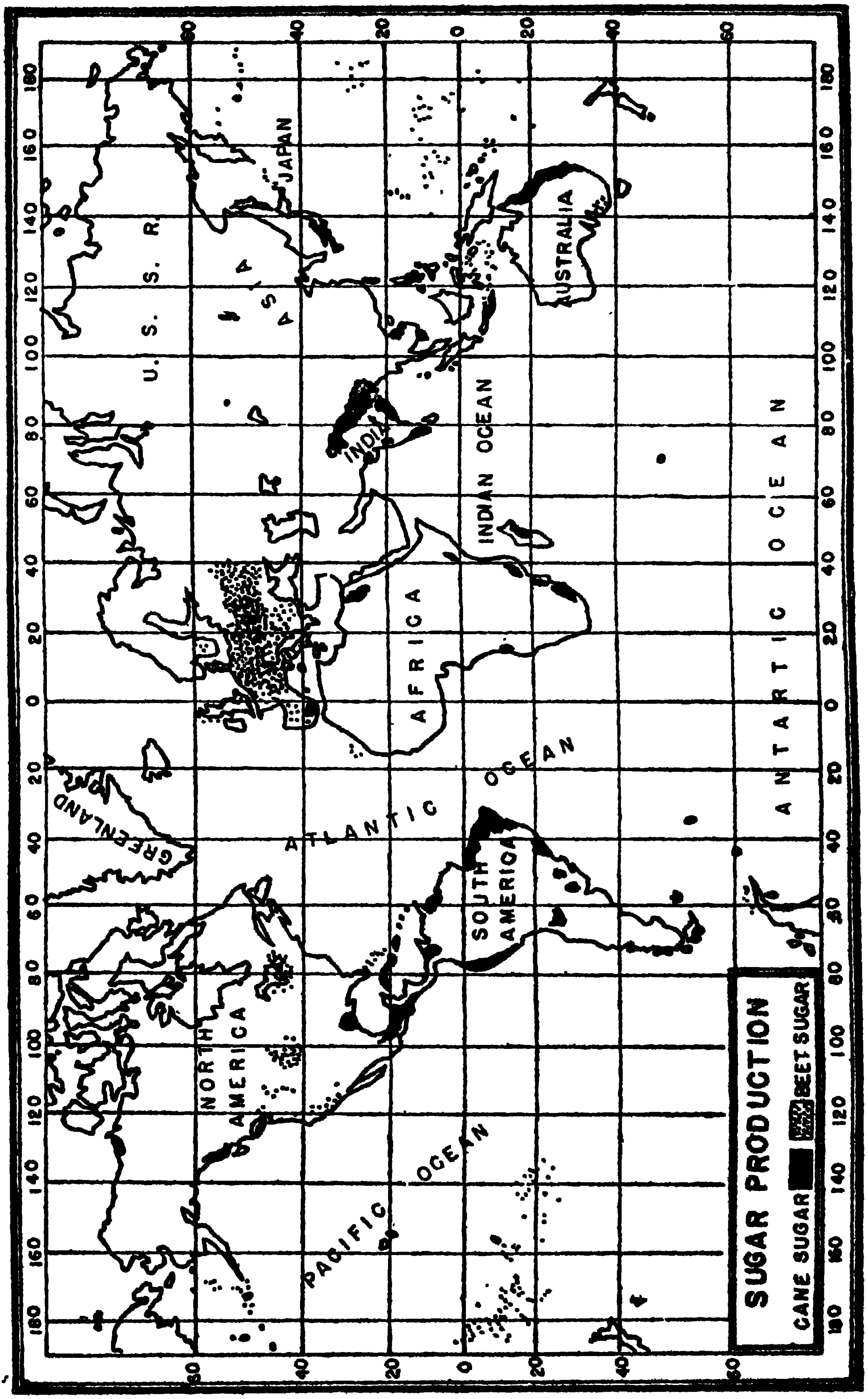

FIG. NO. 21. Sugar production. Note the sugar-beet areas in the temperate region : sugar-cane, a tropical product.

Fruit :—Fruit, an important article of commerce, is grown all over the world. Formerly the demand for fruit was confined to the outlying areas as it could not stand distance and time, and, therefore, it was not an important item of foreign trade. But the invention of cold storage methods, and the introduction of fast transportation system have greatly helped the movement of fruits from place to place. For commercial purposes, fruits of tropical and temperate regions are important.*

Tropical fruits:—Banana, mango, date, guava, pine-apple and melon are some of the chief fruits of the tropics.

Of all tropical fruits banana is the most important. It is not only one of the staple articles of food in many equatorial regions where it is grown but it is in great demand in the temperate regions also. Banana tree requires warm climate and abundant rain. Consequently, it is grown in the West Indies, Central America, north of South America, Jamaica, Costa Rica, Columbia, Honduras and Guatemala, from where it is mainly exported to the U. S. A. and Europe. Banana exports for 1949 from the world's exporting countries are estimated at 94·2 million bunches. The U. S. A. is the largest singular importer of banana and takes about ⅔ of the world's total export. The Western Hemisphere supplies about 85 p.c. of the bananas entering international trade and the rest come from Africa. Four countries—Costa Rica, Honduras, Panama and Gautemala —account for 50 p.c. of the world's total export. In 1949, of the total banana exports from the world, North America took 67 per cent., Europe 24 p.c. and South America 8 per cent.

Pine-apple is cultivated in the Str. Settlements, West Indies, Florida and Siam. As a plant it requires high summer temperature with no frost. The rich exporting countries are Porto Rico, Siam and Str. Settlements. Mango is a very delicious fruit of the tropics but up till now its export is small. Attempts are being made in India to open markets in the U.K. for Indian Mango. Date is essentially a product of the desert ; it grows extensively in North Africa, Iran and North-West Pakistan. It is an important article of commerce, and it is in great demand in Europe and the U.S.A. Another widely used tropical fruit is cocoanut, but the general demand is more for copra, than for the fruit.

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* Fruits can also be divided under four headings : *Hard fruits*—apples; *citrus fruits*—oranges and lemons; *soft fruits*—pears, plums, apricots, peaches, grapes, etc.; and *bananas*.

Temperate fruits:—Temperate fruits may be divided into two groups (1) Warm temperate fruits, (2) Cool temperate fruits.

The coast-lands of the Mediterranean fall within the warm temperate zone. The climate is distinguished by warm summers, mild winters and winter rain. In these areas olive, figs, grapes, apricots, oranges, lemons and almonds grow abundantly. These fruits are known as citrus fruits. Production of citrus fruits—oranges, tangarines, grape fruits, lemons and lime—by major producing countries in 1949 was estimated at 352 million boxes (a box weighing 80 to 90 lbs.). The world production of grape fruit in 1949 was 40 million boxes.

Olive is important as a fruit and also for its oil. It is a native of Asia Minor and is strictly limited to the Mediterranean climatic regions. Plenty of cheap labour is necessary for picking olives by hand. The important olive-producing regions are Spain, Italy, Greece, Portugal and Tunis. Olive oil is used for the manufacture of soaps. It is also employed for cooking, lighting and medicine preparations. The olive-exporting countries are Italy, Greece, Tunis and Algeria.

For successful cultivation, grapes require well-drained land with a sunny warm season and, therefore, the Mediterranean regions are the best. The chief grape-producing countries are France, Italy, Spain, Southern Russia, Algeria, Greece, Western Asia, California, parts of Argentina, Cape of Good Hope, Chile and South Australia. Grapes are marketed in three forms, *e.g.*, fresh for table consumption, dried as currants, and juice as wine.

The apple is mostly found in the U.S.A., Canada, North Africa, South Australia, Chile and England. But the U.S.A. is the leading country both in production and export. The orange is another important fruit of the Mediterranean region though it can be grown both in the tropics and sub-tropics. Spain is the leading producer of orange, closely followed by California and Italy. Lemons are grown in all the continents; but their cultivation is the greatest in the Mediterranean region.

Other warm temperate fruits, such as apricots, almonds, figs, etc., are in considerable demand outside the growing areas.

The Cool Temperate Fruits:—In the cool temperate zone apples, pears, cherries and plums are the noted fruits. Apples are grown best in Canada, Tasmania, New Zealand, Australia and Nova Scotia. British Isles also grow apple of high quality, but the quantity is too small for foreign trade. British Columbia, California and Tasmania have a large production of pears. Plums are found in large quantities in Siberia.

For the export of temperate fruits the U.S.A., Italy, Turkey, Spain, Greece, Iran and Algeria are prominent. Recently Rumania and Tasmania are also exporting fruits in considerable quantity.

Spices :—From very early times there has been trading in spices, which are important not only for improving the palatability of food, but also for the preparation of flavouring oils. Spices are mostly the products of the tropics. Generally high temperature and heavy rainfall are required for the cultivation of most of the varieties.

Of innumerable spices of the tropics, pepper, ginger, cloves and cinnamon are important for foreign trade.

Pepper is the berry of a vine-like climbing plant which is grown extensively in Java, Sumatra, Malaya, Borneo, Siam and the Malabar Coast of India. It is put in the market in two varieties—black pepper and white pepper. It is called black pepper when the whole berry is ground, and white pepper when it is powdered after the removal of the outer skin. The United Kingdom is the leading pepper-importing country in the world from where it is re-exported to other countries.

Chilli is the product of an entirely different plant which originated in tropical America. It is a small pod which is dried in the sun before putting in the market. It is extensively grown in the tropics of Asia, Africa and America.

Ginger is the underground stem of a reddy plant indigenous to South Asia and is put in the market in fresh as well as sun-dried conditions. The large-scale cultivation of ginger is confined to South America, West Africa, China, India and West Indies.

Cloves are dried, unopened flower buds of "eugenia caryphyllata" and are used not only in cooking confectionery and liquors but also as a source of oil which is largely used in perfumery. Zanzibar and Pemba (on the eastern coast of Africa) contribute four-fifths of the world's supply of cloves. The other countries producing cloves are Penang and India. In India it is cultivated in the Madras State.

Cinnamon is the dried bark of a small evergreen tree, native of Ceylon. The cultivation has spread to Java, Brazil, West Indies, Indonesia and China. Apart from its use as a spice, it is also important for its oil which has medicinal properties. Southern India produces considerable quantities of cinnamon.

The other minor spices are nutmegs, mace, vanilla, allspice and cardamoms.

Though the tropics are noted for the production of many kinds of spices, a number of plants furnish spices in the temperate regions as well. Among these are mustard, soya, caraway seeds, coriander seeds and aniseed.

Mustard is obtained from the ground seeds of mustard plants which grow in many parts of Europe. Coriander seed is in demand for its use as a flavouring element in confectionery. Soya sauce is in much demand in Japan and Manchuria to improve tasteless food like rice.

Sago :—It is a very nutritious and easily digestible food. The Sago-palm requires heavy rain and high temperature, and is grown in swampy places. It grows to a height of nearly thirty feet and has enormous long leaves. Indonesia and the Malaya Peninsula contains extensive Sago plantations.

Arrowroot :—It is obtained from the tubers of a plant which grows from two to three feet in height. The plant is cultivated in the West Indies, Indonesia, Bengal and other tropical countries.

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*THE DEGREE OF SELF-SUFFICIENCY IN FOODSTUFFS OF CERTAIN IMPORTANT COUNTRIES

Although the world's food production has kept fairly steady, there is food shortage in many countries owing to reduced production and increased population. In the Far Eastern countries, the production has gone down during the post-war period by more than 5 million metric tons. Because of the increase in

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*Kuczynski, R R., *Living Space and Population Problems* (1939).

domestic consumption in the exporting countries, grain exports have also fallen. At the same time in 1948-49, the world production of main foods was equal or better than the pre-war average. Compared with the average for 1938-39, the crop position to-day is as follows:

Wheat	105	Barley	100
Corn	125	Rice	98
Oats	100	Potatoes	105

The present shortage is therefore due to increased and increasing world population.

Let us now examine the degree of self-sufficiency in foodstuffs of the various countries of the world. As a rule, the highly industrialised countries are not self-sufficient, and they depend for foodstuffs on agricultural countries where the population is generally thin. The following figures relate to the period ending 1938.

Country	*Per cent*	*Country*	*Per cent*
Great Britain	25	Brazil	96
Norway	43	Spain	99
Switzerland	47	India	100
Belgium	51	China	100
Holland	67	U. S. S. R.	101
Finland	78	Denmark	103
Greece	80	Poland	105
Germany	83	Bulgaria	109
France	83	Rumania	110
Sweden	91	Hungary	121
U. S. A.	91	New Zealand	123
Chile	93	Canada	192
Portugal	94	Australia	214
Italy	95	Argentina	264
Japan	95		

From the above figures it becomes clear that in view of the growth of population efforts should be made to increase the world's crop production. Two authorities have made careful estimates of potential expansion in the world's crop production. One states that an increase of three-quarters might be attained by enlarging the world's cultivated area of 3,600 million acres to 4,000 million acres and raising the yield per acre by 50 p.c. The other estimate presumes that the area now in food crops can be made to yield some 20 p.c. more produce through the introduction of improvements not very difficult to attain and that 1,300 million acres can be added to the present area. The sources of the 1,300 million acres are: 900 million acres in South America and Africa ; 100 million in Sumatra, Borneo, New Guinea and Madagascar ; and 300 million in U.S.A., Canada and U.S.S.R.

INDUSTRIAL CROPS

Cotton :—It provides the civilised world with a large portion of its clothing. There is no other plant that comes so close to the civilised man and none which we use so much every day.

It has a considerable climatic range ; but it grows well in warm, moist and even climates where the summer is long and

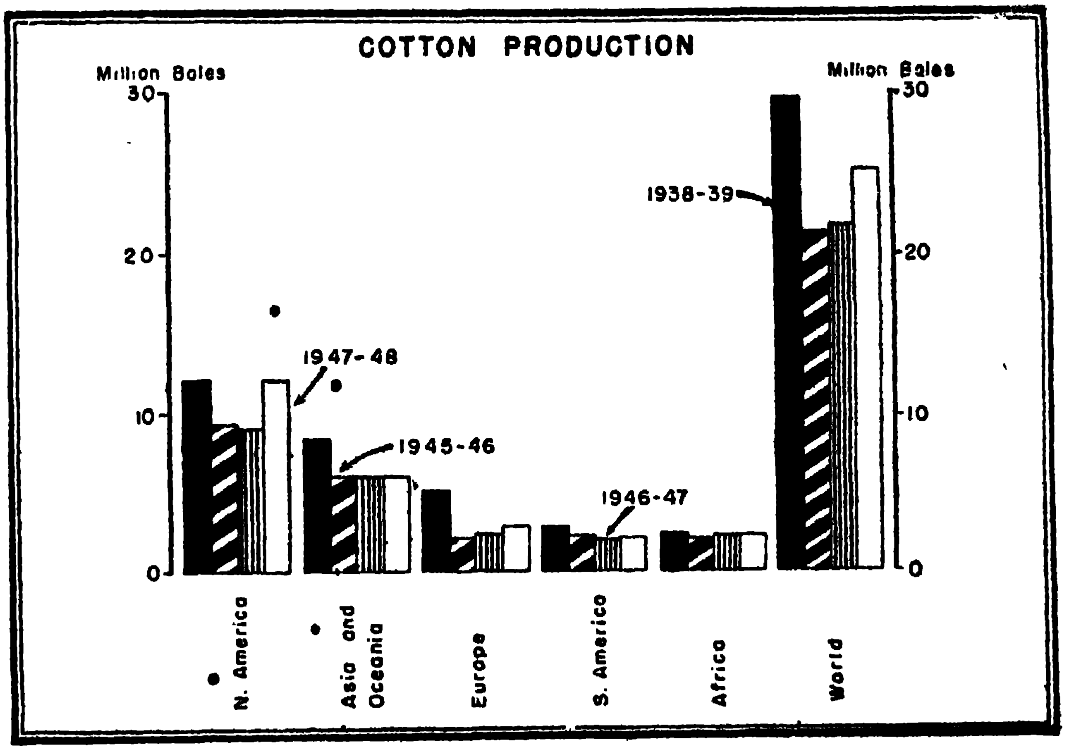

FIG. No. 22.

where there is salt in the soil. Sea breeze is beneficial for the quality of the fibre. So the ideal situation for a cotton plantation is on lowlands near the sea or preferably on islands in tropical or semi-tropical latitudes.

U.S.A. is by far the greatest producer of raw cotton. Next in order are India, China and U.S.S.R. These four countries together produce the bulk of the world's crop. The other important producing countries are Brazil, the Sudan, Iran, Mexico, Peru, West Africa, Uganda and Japan.

WORLD PRODUCTION OF COTTON FOR YEARS BEGINNING 1ST AUGUST*

(In 1,000 bales of 478 lbs. net, except in running bales for United States)

Country	1938-39	1947-48
World (total)	29,474	24,947
North America (total)	11,964	12,028
United States	11,617	11,500
Mexico	307	485
Other countries	40	43
Asia and Oceania (total)	8,274	5,862
China	2,301	2,150
India	5,082	3,200
Other countries	891	512
Europe (total)	3,959	2,731
Soviet Union	3,800	2,600
Other countries	159	131
South America (total)	2,697	2,089
Argentina	261	350
Brazil	1,989	1,300
Peru	378	325
Other countries	69	114
Africa (total)	2,580	2,237
Belgian Congo	172	185
Egypt	1,692	1,288
Anglo-Egyptian Sudan	263	226
Uganda	254	142
Other countries	199	396

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* In the above tables, India includes the Indian Union and Pakistan.
Source : *Commerce*, Bombay, 4th Sept., 1948.

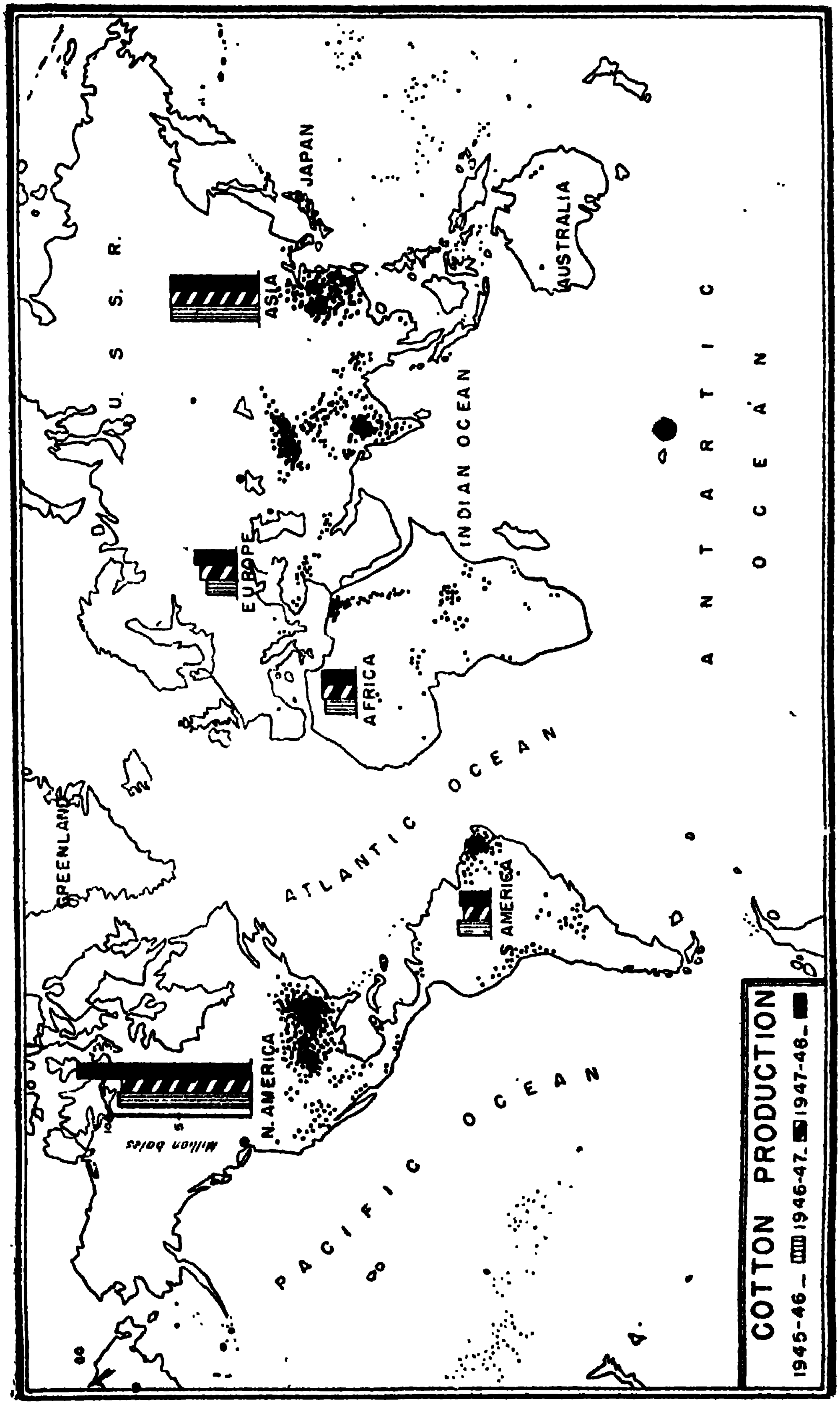
U. S. S. R.
JAPAN
ASIA
AUSTRALIA
INDIAN OCEAN
ANTARCTIC OCEAN
EUROPE
AFRICA
GREENLAND
ATLANTIC OCEAN
S. AMERICA
N. AMERICA
PACIFIC OCEAN
Million bales
COTTON PRODUCTION
1945-46
1946-47
1947-48

FIG. No. 23.

The world production of cotton in 1950 was in the neighbourhood of 30 million bales.

Of the several varieties cultivated for market, four stand out prominent: *the Sea Island, the Egyptian, the Peruvian, the Upland.* The first named has the largest, finest and silkiest fibres. The plant can be grown only upon lowlands and it takes its name from the fact that it was first raised on islands off the coasts of South Carolina, Florida and Georgia (in the U.S.A.). It is sometimes known as long-staple cotton. Egyptian cotton, also called medium-staple cotton, is specially suited to the manufacture of goods requiring a smooth finish and is less expensive than sea-island cotton. Peruvian cotton possesses a rough, strong fibre, similar to that of wool. It is well adapted to mixing with wool and is used in the manufacture of underwear and hosiery. Upland cotton is the most widely used and the most abundant of all varieties.

Recently there has been a tendency in almost every cotton-growing country in the world to increase the output of cotton of better varieties.

U.S.A. grows nearly 50 per cent of the world's commercial crop. The cotton area stretches in one big belt from North Carolina to Texas. The chief cotton-producing States of the U.S.A. are Texas, Mississippi, Arakansas, Alabama, Georgia, North and South Carolina, Luisiana, and Tennessee. The U.S.A. cotton consists of two varieties—the Sea-Island and the Upland. Much of the produce goes to the U.K. The principal cotton ports are Galveston, New Orleans and Savannah.

Indian cotton is mainly produced in the fertile volcanic black soil area of the Deccan. It is coarse and of short staple. Pakistan raises cotton mostly of American variety. Of late, both in India and Pakistan, the proportion of crop larger than $\frac{7}{8}''$ has increased substantially, although the bulk of the crop is still shorter than one inch. Egyptian cotton is grown in the Nile Valley. The chief port from which it is exported outside is Alexandria. Brazilian cotton is cultivated on the coastal lowlands and is exported from Bahia and Pernambuco. With the exception of India, Uganda is the largest cotton-growing country within the Commonwealth. The prosperity of Uganda has been closely bound up with the cotton crop ; the extension of roads and railways and the expansion of towns are due to the rapid progress made in this industry during the last twenty years. At present Uganda supplies about 2 p.c. of the world's total output of cotton. Belgian Congo is becoming an important producer of raw cotton. In 1949, the cotton production of Belgian Congo was 147,000 metric tons.

The yield of cotton per acre is not the same in the different countries.

YIELD OF COTTON PER ACRE

Countries	*Yield*	*Countries*	*Yield*
Egypt	531	Soviet Union	322
Peru	508	U.S.A.	264
Anglo-Egyptian Sudan ..	277	Brazil	154
Argentina	151	Uganda	84
		India	84

The difference in average yield is due to the diversity of conditions under which cotton is grown.

Cotton is a very important article in international trade. The principal importers of cotton are the U.K., Japan, Germany, France, Italy and China. Before 1942 Japan was the largest importer of cotton in the world.

IMPORTS OF COTTON BY THE PRINCIPAL IMPORTING COUNTRIES, 1950-51

(In thousands of metric tons)

Country		*Country*	
Japan	358·5	Italy	202
U.K.	354·8	China	39
Germany	188	India	113·8
France	176	World Total	2074·1

U.S.A., India and Egypt are the three principal cotton-exporting countries of the world. U.S.A. sends annually more than 1·5 million metric tons of cotton. Pakistan will also become in near future an important supplier of raw cotton.

WORLD EXPORTS OF COTTON, 1950-51

(In thousands of metric tons)

U.S.A.	932	Egypt	334
Brazil	148	Mexico	208
Pakistan	226·1	Turkey	79
Anglo-Egyptian Sudan	81	World Total	2074·1

Other major exporters and their principal countries of destination were: U.S.S.R., 185,000 tons, almost entirely to eastern Europe ; India, 33,000 tons, mainly to the United States, Japan and the United Kingdom ; Iran, 23,000 tons, mainly to Italy, the United Kingdom and western Germany ; Syria, 28,000 tons, mainly to France, the United Kingdom, Switzerland and Japan ; Belgian Congo, 47,000 tons, mainly to Belgium and the United Kingdom ; French Equatorial Africa 26,000 tons, almost entirely to France ; Mozambique, 26,000 tons, entirely to Portugal ; Uganda, 66,000 tons, principally to India and the United Kingdom ; Argentina, 54,000 tons, principally to Italy, Japan and the United Kingdom.

In the matter of cotton the Commonwealth is not at present self-supporting, although it raises 34 p.c. of the world's total. The demand for cotton in the British Commonwealth is far in excess of the actual needs of the people living there. This is because the United Kingdom manufactures cotton goods largely for foreign markets. Cotton grown in the Commonwealth mostly comes from India and Uganda, and it is generally inferior in quality. Therefore, it finds little favour with Lancashire which has to import this raw material from the U.S.A. and Egypt. About three-quarters of the cotton used in Lancashire consists of finer varieties from the U.S.A.

Measures are being taken to make the British Commonwealth self-supporting. Northern Nigeria, Nyasaland and the British East African Colonies of Tanganyika and Kenya can grow huge quantities of cotton. Already the Sudan has made much progress in cotton cultivation. A great dam at Sennar on the Blue Nile has been constructed to irrigate the Gezira district which raises cotton in increasing quantity and of improving quality. Recently Sind and the Punjab in Pakistan have begun to raise American cotton with improved seeds and better irrigation facilities.

The spread of civilization and the rise in the standard of comforts are increasing the demand for cotton and, therefore, there is need for increasing the areas of cotton production. Fortunately there are immense possibilities of increasing such areas. Outside the Commonwealth the West Indies can grow more long-staple cotton of Sea-Island type than they do now. Before 1941 Russia, with fairly cheap labour and vast land, was becoming more and more important as a cotton exporter and relieving the pressure on the ordinary American upland. Her chief difficulties were defective transport and deficient rainfall. Formerly cotton cultivation in Russia was confined to Trans-Caucasia and Turkistan. In recent times it has been extended to the Crimea, Black Sea coast, the coastal region of the Sea of Azov, and the Ukraine. There are also great possibilities of cotton cultivation in Mexico, Korea and Manchuria.

Jute*—Next to cotton, jute is the most important tropical fibre crop. It is mainly used for the manufacture of cordage, carpet, coarse gunny cloth and sacking. "The demand for jute in the world's market is based upon the fact that no cheaper fibre is procurable for bagging agricultural produce." Although many fibres are now available for commercial use, jute still continues to hold the field as a fibre which can be produced at an exceptionally low cost and is consequently suitable for the production of a wider range of articles.

Jute is a tropical plant and generally grows to a height of 5 to 10 ft.† Although jute is a tropical plant, its cultivation is confined almost exclusively to the Lower Gangetic plain of India and Eastern Pakistan. About 74 p.c. of jute raised in India and Pakistan comes from East Bengal. The necessary conditions for the successful cultivation of jute are: (*a*) a high temperature with a minimum of about 80°F during the period of growth ; (*b*) a suitable soil ; (*c*) sufficient rainfall; (*d*) distribution of rainfall over the period of growth ; (*e*) an ample supply of water for retting the plants and for washing the stripped fibre ; (*f*) a suitable and efficient supply of labour to handle the crop at the proper time ; and (*g*) facilities for placing the fibre on the market. The plants are grown in three different kinds of soil :—(*i*) rich sandy loams of high lands ; (*ii*) *chur*-lands, *i.e.*, alluvial soils which are situated in the neighbourhood of the river tracts and which are flooded during the rainy seasons ; (*iii*) low-lying lands on the sides and in the deltas of the rivers.

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* This is called "Patta" in Sanskrit and "Pat" in Bengali. It is a bast fibre found between the bark and the inner portion of the stem.

† The commercial jute fibre is obtained from two species of plants belonging to the order *Tiliaceae*. These two species of jute plants are known as *Corchorus Capsularis* and *Corchorus Olitorius*, the respective fruits of which are capsules and pods. Both these plants grow to a height of from 5 feet to 10 feet. In general, the fibre varies from 4 ft. to 10 ft. in length. The stem of the plant is round with half an inch in diameter. (*Jute and Jute Spinning* by Woodhouse and Kilgour).

All the above climatic, physical and human factors are found in Eastern Pakistan and the lower Gangetic Valley of India. The quality of the fibre and the yield per acre depend in a large measure upon the preparation of the soil. The East Bengal jute is strong and hard and is suitable for the manufacture of high-grade hessians which account for about 48 p.c. of jute manufactures. Brazil, Ceylon, Formosa, China and Malaya also grow a little jute. *Brazil has prepared a five-year plan called "Salte" which aims at a five-fold increase of jute production by 1953. The target has been fixed at 50,000 tons and this is expected to enable Brazil to dispense with supplies from overseas.* Jute may also be grown in Egypt, Iran, Siam, Indo-China, Japan, Mexico and Paraguay.

WORLD PRODUCTION OF JUTE

(*thousand metric tons*)

Period		Indian Republic	Pakistan	Other Countries	Total
Average	1935-39	.. 360	1125	25	1510
	1948/49	.. 301	1242	35	1578
	1950/51	.. 597	1090	43	1730

Indian and Pakistani jute is mainly exported to the United Kingdom, Germany, the U.S.A. and France. Canada, Japan, Italy and Argentina also import large quantities of jute.

Jute manufactures may be divided into four classes : (*a*) gunny bags, used for packing rice, wheat, oilseeds, etc. ; (*b*) gunny cloth or hessians ; (*c*) coarse carpets and rugs ; (*d*) cordage.

In India the jute-manufacturing industry is highly localised in a small area on the banks of the Hooghly, near Calcutta.

This area is ideally situated for the centralization of jute industry because of the proximity to the raw material, plentiful supply of cheap labour, moist climate, nearness to the port of Calcutta and navigability of the river.

Outside India, the most important jute-manufacturing centre is Dundee in Scotland. Calcutta and Dundee supply the world's requirements for manufactured jute and there is a keen competition between these two centres. It was the privilege of Dundee to control the world market for manufactured jute up till 1908: since then Calcutta has been enjoying the leadership of this industry.

Jute cultivation has largely displaced rice in many tracts of East Bengal and given rise to the danger of depending too much on one crop. Although East Bengal produces 74 p.c. of jute of undivided India, the jute mills are all located in Indian Union. Nor can Pakistan establish jute mills immediately in view of the world shortage of capital goods and paucity of capital in Pakistan. Export is of primary importance to both India and Pakistan inasmuch as Pakistan cannot consume the jute she grows, nor can India the manufactured jute she produces.

Jute bags are being displaced by the use of elevators and bulk shipment in transit in many countries. Many substitutes have also been discovered in several countries to compete with jute in the world market. Russian hemp has found considerable room in the markets of Indian jute. Paper bags are now-a-days used in the cement trade of the U.S.A., to the exclusion of jute bags. In the U.S.A., Germany, and other continental countries textile yarn made from wood-pulp was offering a certain amount of competition to the jute textiles inside electric cables. At present attempts to grow jute are being made everywhere. Experiments are being conducted to cultivate real jute in Abyssinia. A jute-like fibre called Rosella is being extensively grown in Jàva. It is reported that Java will be self-supporting so far as sugar bags are concerned in future. The South Africans are at present experimenting with the fibre of a plant called *wild stokroos* which may prove suitable for the manufacture of wheat bags. This plant is now cultivated in East Transvaal.

During the war years of 1939-45, when the jute trade was interrupted owing to hostilities, cloth, paper bags and a few substitute fibres became very popular as packing materials and captured a considerable part of the markets held by jute. Since 1946, consumers have again shown a tendency to prefer jute. What really assisted these substitutes to invade the jute market during the war years was not their superior quality but only the non-availability of adequate quantities of Indian jute. As regards paper bags, the advance made in recent years was mainly the result of changes in packing requirements. The producing countries like the U.S.A. and Canada only are in a position to use paper bags with advantage. Compared to paper bags and cloth, jute has good competitive strength owing to its lower price, greater durability and re-use capacity. Cultivation and production of a few jute-like fibres may be possible, but, it is doubtful if any other vegetable fibre can be grown as a commercial crop to compete with jute. Nowhere else such natural favourable conditions of production and cheap labour are available as in India and Pakistan.

Hemp :—It is a plant grown both for fibre and for seed. The fibre is manufactured into cordage, sacking, sail cloth twine and ropes. The seed is used principally for poultry food and its oil is an important constituent for certain paints and varnishes.

Hemp has a wide range of cultivation, for it is grown in tropical and temperate parts of the world. The plants after flowering are removed from the fields, dried in the sun and soaked in water for two weeks. The fibre is then separated from the wood by constant beating. Russia, Italy, China, Hungary, India and the U.S.A. are the leading producers. About 80 per cent of the hemp crop is grown in Europe.

Both in area and production, the U.S.S.R., holds the first position in the world. The principal growing areas are the Kursk and Orel Oblasts, Ukraine and Mordovia. Italy produces the best quality hemp though it ranks far below Russian hemp in quantity. In the U.S.A., the important hemp-growing areas are Ohio, Wisconsin and Kentucky. The Philippine Islands produce fine quality hemp known as Manila hemp, which is mainly used for ropes and cordage.

Mexico, Tanganyika and Kenya raise Sisal hemp which is noted for its hard fibre. Sisal hemp is mainly used for making binder-twine.

India is a great producer of hemp and it is grown in Madras, Bombay, M. P. and U. P. Indian hemp is exported to the U. K., Belgium, Italy, France, Germany and Denmark.

Flax:—It is cultivated both for fibre and for seed. The seed is of importance for the extraction of oil which is used in the manufacture of paints and varnishes, while the fibre is used for twine and canvas as well as for various types of linen cloth.

The two products—fibres and seed—rarely come from the same plant. In tropical and sub-tropical areas flax is grown for seed, while in cool temperate areas it is raised for fibre. The cultivation of flax is largely confined to those lands where there is a dense population with a low standard of living, for heavy manual labour is required in pulling up the plant by the roots, removing the seeds with comb and wetting the straw to cause soft parts to rot, when fibre will be separated from them. Consequently it is raised in India, U.S.S.R., Italy, Ireland and Argentina. The U.S.S.R. holds first place with regard to flax fibre. The principal flax raising oblasts are Kalinin, Leningrad, Byelorussia and Kirov which are all parts of the U.S.S.R. In U.S.S.R. flax production has now been mechanised to a great extent. The flax production is confined to northern part of the U.S.S.R. like Kalinin, Smolensk and Leningrad.

The crop is raised for fibre in Western Russia, Poland, Holland, France, Ireland and Belgium. In India, U.S.A. and Argentina it is cultivated for seed. The important exporting countries are U.S.S.R., Belgium, Argentina and India.

Silk:—Silk is a useful material which is complementary to cotton and cotton textiles. Apart from its use as apparel, silk is used in electric insulation and surgical equipment and is indispensable for typewriting ribbon. It is also used for parachutes, tapes and cordite cloth. Although silk is a fibre of animal origin, its production depends on the cultivation of certain trees of which the mulberry tree is the most important. The silk-worms thrive on the leaves of these trees. The silk-worms or caterpillars spin cocoons from which silk is collected. The mulberry is a tree belonging to the *Morus* family. It is of three principal species of each of which there are several varieties in the different countries. The *white* mulberry is a native of

China and was introduced into South Europe about the sixth century. It is now the most important tree in almost all the silk-growing areas. The *real mulberry* is a native of North America. Its leaves are not very suitable for silk-worms and the cocoons of worms fed on its leaves are generally of a very inferior quality. Mulberry is often planted on grounds which cannot be used for other crops, thus, for instance, on the edge of river banks and shores or along high roads. The principal silk-producing countries are China, Japan and Italy. Small quantities are also produced in India, France, Spain and Asia Minor. China is the greatest silk-producing country and exports 18 per cent of the world's silk supply. It is a household industry in China. Before the Second World War Japan was the greatest silk-exporting country. Nearly 90 per cent of Europe's silk comes from the Po Valley in Italy.

Raw Silk. Production, Exports and Imports of Selected Countries, 1938 and 1948 to 1950[*]

(Thousands of metric tons)

Item and country	1938	1948	1949	1950
Production :				
Japan	43·15	7·98	9·71	8·89
China	3·20	0·40	0·40	...
Italy	2·74	1·97	1·14	1·37
India	...	1·00	0·95	1·03
France	0·11	0·04	0·04	0·05
Exports :				
Japan	28·7	4·80	2·92	5·68
Italy	2·6	1·41	0·41	0·59
Imports :				
United States ..	24·67	4·23	1·76	4·28
United Kingdom ..	2·65	0·59	0·60	0·78
France	2·46	0·62	0·79	0·95
Switzerland ..	0·27	0·22	0·30	0·53

Brazil is practically the only American country which raises silk-worms. The chief areas are Sao Paulo, Espirito Santo and

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[*] *Source* : Food and Agriculture Organization of the United Nations.

Minas Garaes. Recently raw silk is being raised in Barbacena district in Minas Garaes, the Amazon and Para.

On the Atlantic coast of Brazil, there are also small centres of sericulture.

Normally, the principal exporting countries are Japan (73 p.c.), China (10 p.c.), Korea (6 p.c.), Italy (6 p.c.) and Manchuria (4 p.c.). The most important markets for raw silk in the world are France, the U.S.A., Japan, U. K., Germany, Canada and India. U. S .A. takes about 66 p.c. of the world's total export of raw silk, followed by France (7 p.c.), Japan (6 p.c.), U. K. (5 p.c.), and India (4 p.c.).

Rayon has acquired in a brief span of years world-wide importance. *Rayon* is the generic term for manufactured textile fibre or yarn produced chemically from cellulose or with a cellulose base. "The cellulose in cotton waste or wood is reduced to liquid pulp by a chemical process and then forced through capillary tubes which change it into a fibre." It is possible to spin and weave this fibre without changing the existing equipment of silk mills. Rayon is in great demand among the manufacturers, for it may be used with cotton, silk, linen and wool. Although natural silk is lighter in weight, softer, finer, more lustrous and elastic than rayon, the price of the former has been affected to a great extent by the large-scale use of the latter. The rayon-producing countries in order of importance are the U. S. A., Japan, Italy, Germany, U. K., France and Holland.

WORLD OUTPUT OF RAYON

(In millions of kilos)

	1935	1937		1935	1937
Japan	102	175	Germany	68	107
U.S.A.	115	145	U.K.	56	68
Italy	74	120	World Total	493	750

The world output of rayon has been steadily rising in the post-war period. Europe is the original home of rayon, and the industry was developed on a commercial scale in France in the earlier stages. The U. S. A. is at present the world's largest rayon producer accounting for 975 million lbs. of rayon in 1948 out of the total world production of 2000 million lbs.

in the same year. Despite this increase, rayon supplies are still running below demand.

Rubber :—It has become the foremost plantation crop of the Wet Equatorial region and the most valuable plantation crop in the world. Fifty years ago it was not an important item in commerce or industry ; to-day it is a major commodity. The first commercial use of rubber was as erasers, hence the name 'rubber'. As its qualities became known, it was put to more and more uses such as the manufacture of water-proof fabrics, soles for footwear, sports gear and bicycle and vehicle tyres. However, it was the beginning of the motor car industry at the turn of the present century which first created the huge world demand for rubber.

Rubber is obtained either from plantation or from wild rubber trees. The rubber tree is found in areas having a heavy rainfall and a rich, deep, loamy soil which is well-drained. It is, therefore, grown in the equatorial areas like the Congo basin, the Amazon basin and Indonesia.

Plantation rubber is now an important industry and the output is increasing with tremendous strides. Till 1898 all rubber was derived from the wild trees of South and Central America. In 1900, of the total world production of 54,000 tons of rubber, plantation rubber accounted for only 4 tons. In 1929, however, 95 per cent of the world production of rubber was plantation rubber.

Wild rubber mainly comes from Brazil, Columbia, Venezuela and Belgian Congo. In Brazil, it grows in the Acre Territory, Amazon and Para. Due to war of 1939-45 the collection of rubber in Brazil has been considerably increased and in 1943 about 35,000 tons were raised. The gathering of wild rubber in Venezuela was resumed in 1942 after the fall of the Malaya States. Belgian Congo raised 1,800 metric tons of rubber in 1942.

There are many difficulties in collecting wild rubber. The rubber-gatherer must laboriously open long paths from tree to tree and must trudge for miles each day through mosquito-infested swamps to gather a few pounds of latex. Moreover, the wild rubber areas like the Amazon and Congo basins are hundreds or thousands of miles inland and some of the districts

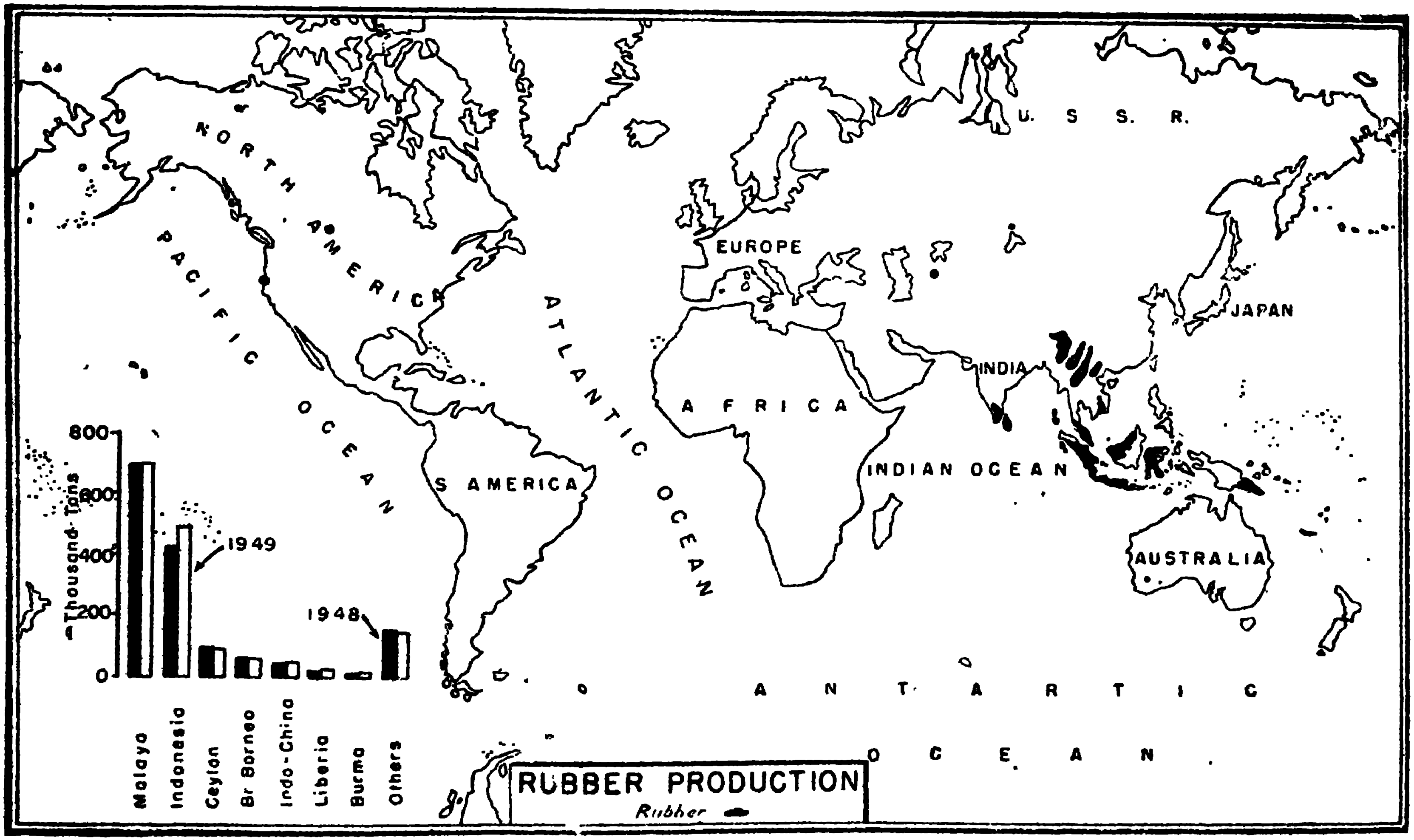
U. S. S. R.
NORTH AMERICA
EUROPE
JAPAN
INDIA
AFRICA
PACIFIC OCEAN
ATLANTIC OCEAN
INDIAN OCEAN
S AMERICA
AUSTRALIA
ANTARTIC OCEAN
800
600
400
200
0
Thousand Tons
1949
1948
Malaya
Indonesia
Ceylon
Br Borneo
Indo-China
Liberia
Burma
Others
RUBBER PRODUCTION
Rubber

FIG. No. 24.

are remote from the trade routes. On the other hand, almost all the important rubber plantations are conveniently situated near the sea-coasts of Asiatic tropics and along one of the world's greatest sea-routes. Plantation rubber has made it possible (*i*) to reduce the labour of gathering latex, (*ii*) to take advantage of the cheap and abundant labour supply of more densely populated parts of the tropics, and (*iii*) to locate the industry near good and convenient trade routes.

Most of the rubber plantations are found on or near the coast of Indonesia and of Malaya Peninsula and 90 per cent of the world's total output comes from this region. The other important areas are Ceylon, India, Brazil and Congo. In spite of the damage sustained during the World War II Malaya is today the world's leading producer of rubber. There are now in Malaya over 3,300,000 acres under rubber and the industry supports two millions of the five million people in the Federation of Malaya.

WORLD PRODUCTION OF NATURAL RUBBER

Territory	('000 Long tons) 1948	1949
Malaya	698	700
Indonesia	432	500
Ceylon	95	90
Indo-China	44	45
British Borneo	62	62
Burma	9	12
Liberia	25	27
Other countries	155	139
Total ..	1,520	1,575

In 1950, the world production of natural rubber was estimated at 1,870,000 long tons. The requirements for manufactured rubber goods in the same year were for 1,530,000 long tons.

More than 60 per cent of plantation rubber is produced in the British Commonwealth and most of the remainder comes from plantations managed or controlled by the Dutch. Although the U.S.A. consumes nearly two-fifths of the world's crop, her part in the production of rubber is practically insignificant.

In the early days of the rubber industry, there was no correlation between supply and demand, and this was responsible for violent fluctuations in the price of rubber to the prejudice of planters. The degree of maladjustment was increased by the fact that whenever there was a rise in price, there was immediately an expansion of cultivation, despite the fact that there was no real increase in demand. The result was an excess of supply over demand and a great fall in prices. Therefore, a scheme was made to control production. It was known as 'Stevenson Scheme'. The Scheme urged the "producers to restrict their output to a definite percentage of their full capacity, the percentage fluctuating according to demand and resulting price levels". The great defect of the Scheme was that it was applicable only to the British plantations. The plan limited production in the British South-Eastern Asiatic territories so efficiently that prices rocketed sky-high instead of climbing to a moderate level profitable to planters and not prohibitive to buyers. High prices tempted the rubber-planters of the non-participating countries like the Dutch East Indies (now Indonesia) to increase the production to a considerable extent. So world production, in spite of limitation of production in areas covered by the Stevenson Scheme, began to increase with the result that prices fell and stock accumulated. The Stevenson Scheme was brought to an abrupt end in 1928.

An international rubber restriction agreement was then reached in which all the territories of South-East Asia producing rubber joined. The scheme began to operate in June 1934, with the object of regulating the production and export of rubber in order to reduce the existing world stock and maintain an equitable price level, reasonably remunerative to efficient producers. Production and export of rubber were prohibited beyond the agreed quotas. The execution of this international programme was put in the hands of an International Rubber Regulation Committee, composed of Government delegates.

The principal importers of rubber are the U.S.A., U.K., France, Germany, Canada, Japan and U.S.S.R.

U.S.A. has recently acquired some control over the rubber plantations of Brazil and Mexico.

Recently the ***synthetic rubber*** production has made much headway and is fast becoming a rival of natural rubber. The rise in the price of natural rubber and the restrictions on its use, have stimulated the use of synthetic rubber. The U.S.A. has many factories for the development of low temperature chemical rubber from which high mileage auto-tyres are made. If natural rubber is ousted from the field of tyre manufacture, it will be perhaps possible for synthetic rubber to beat natural rubber in the long run. Many other developments in the synthetic field are possible which may bring changes in the future industrial application of rubber. "One such new item is a flexible new synthetic rubber with such hardy resistance to gasoline, oil, paints and most chemical solvents that it serves equally well in printing rollers and aeroplane fuel system parts."

As regards synthetic rubber, America is by far the largest consumer accounting for about 90 per cent of the total. Next comes Canada, with about 4 per cent. The remaining 6 per cent is distributed amongst all the consuming countries put together. It is the U.S.A. market wherein the menace of the synthetic rival is most potent. In 1951, synthetic rubber accounted for 60 per cent of the total rubber consumption in the U.S.A. Canada consumes abt. 4%

('000 Long tons)

	Natural		Synthetic	
	1948	1949	1948	1949
United States ..	627	600	442	410
United Kingdom ..	194	183	2	2
France	86	97	8	8
Netherlands ..	12	10	0	0
Belgium	14	15	0	0
Czechoslovakia ..	25	30	—	—
Italy	30	33	2	3
Denmark	5	5	0	0
Hungary	3	3	0	—
Australia	26	30	0	0
Canada	42	40	20	20
Other countries ..	356	404	6	7
Total ..	1,420	1,450	480	450

		Natural Rubber	Synthetic Rubber
World Production :			
1950	...	1884	543
1951	...	1900	920

Oil-Seeds (Vegetable Oil) :—Almost all vegetable oils are extracted from fruits or seeds. Vegetable oils are in demand not only for salads and other food, but also for preparing perfumery, varnishes, lubricants, candles, soaps etc., as well as for various other purposes.

The sources of vegetable oil are cotton-seeds, cocoanuts (copra), palm-nuts, olives, rape-seeds, sesame, peanuts or groundnuts, linseed, soya beans and castor-seed, most of which are found in the tropics and sub-tropics.

Olive is a product of the Mediterranean region. The oil is extracted for cooking and salads and for use in spinning, weaving and soap-making. Spain, Italy, Greece, North Africa, Portugal and Southern France are noted for olive oil. Cotton-seed-oil is a good substitute for olive-oil, whose demand for industrial purposes is greater than that of any other seed-oil. U. S. A., India, Egypt and Uganda are the large producers of cotton seed. Though the U. S. A. is the largest producer, it does not export it in considerable quantities because of internal demand.

The *cocoanut-palm* makes four principal contributions to commerce, *viz.*, (*a*) copra, *i.e.*, dried kernel of the nut, (*b*) cocoanut oil, (*c*) residual cake, and (*d*) the fibre derived from the husk surrounding the nut. The oil which is extracted from copra is in demand not only for food but also for soap-making. Cocoanuts are largely found in the Philippines, Indonesia, Ceylon, Southern India and other islands of the Pacific. In some cases oil is extracted and exported from producing countries ; in other cases, the trade is in the form of copra. The largest importer of copra is the U. S. A.

The *plant of the groundnut* is grown as an annual crop in most tropical and sub-tropical countries, requiring a light soil, with well-defined wet and dry seasons and a rainfall of 25 to 40 inches. It is an adaptable crop and can be grown by rotation with maize, millets and sorghum The main importance of the nut is in the production of oil. The oil content of the groundnut is about 42 per cent while the residual press-cake forms a valuable cattle food. The nut is also used in the confectionery trade and for making peanut butter.

The groundnut is cultivated in India, Brazil, East Africa, China, the Philippines and Korea. India is by far the largest exporter of groundnuts. The chief importing countries are France and Germany.

The world production of groundnuts has been estimated at about 50 lakh tons during 1949 as against about 47 lakh tons in 1948. The table below shows the output in the main producing countries in the world:—

(In '000 tons)

Country	1938	1948	1949
Argentina	60	100	100
India	2,500	2,800	3,070
U. S. A.	500	938	800
Br. West Africa*	250	300	400
Fr. West Africa*	450	200	200
East Africa*	60	50	60
Indonesia	165	165	182
China & Manchuria	80	20	20
Total (including others)	4,200	4,700	5,000

Linseed is merely another name of flax-seed, which is chiefly used in the preparation of paints and varnishes and oil-cloth. Linseed is largely grown in Argentina, Italy, U. S. S. R., India, and U. S. A. Four-fifths of the entire quantity of linseed that enters into foreign commerce come from Argentina.†

So far as the world trade is concerned, the linseed production of the U. S. S. R. is of no importance as it is entirely absorbed by the internal market. Of the other countries producing linseed, Canada is the only one of any importance. The principal countries importing linseed are the United Kingdom, France, Italy, Germany, Holland, Belgium and Sweden.

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* Exports only.

† Linseed originated in Central Asia and was first cultivated for its fibre. It was introduced into Argentina in the second half of the 19th century.

The recent features of the international trade in linseed are the increasing importance of Indian linseed in the United Kingdom and the heavy importations of Argentina and Indian linseed into the U. S. A. to meet an expanding demand.

The world production of linseed during 1949 amounted to only 29 lakh tons as against 33 lakh tons in 1948. The following figures show the production of linseed before and after the War.

LINSEED PRODUCTION

(*In '000 tons*)

	1938	1948	1949
Argentina	1,500	900	495
India	400	400	375
U. S. A.	200	999	1,037
Russia	750	400	500
Canada	30	300	125
Total (including others)	3,100	3,300	2,900

Three significant facts are that the production of linseed in Argentina is slightly less than one-third of the pre-war level; secondly, the production of linseed in the U.S.A. is nearly five times the pre-war level and thirdly in India production has been maintained at about the pre-war level. India is the only important soft-currency country which produces and exports reasonable quantities of linseed.

Sesamum is an annual plant thriving in the tropical and sub-tropical parts of the world. Its seed is an important source of oil in India and China. Palm-oil is obtained from palm fruit and is used for soap, candles and lubricants and also for making edible butter and fats. The palm fruits are found in West Africa and Indonesia. In India its cultivation for oil is practically unknown.. In 1946, the world production of sesamum was 4,97,000 tons as against 6,54,000 tons in 1938.

Castor plant is cultivated in India, Brazil, Java, Indo-China and Manchuria. The oil is extracted from the bean and is very useful for medicinal purposes and soap-making and also as a lubricant. The exports of castor-seed for oil from India go to U. K., France, U. S. A., Belgium and Germany.

The world outturn of castor seed during 1949 amounted to about 5 lakh tons as compared with the 1938 production of about 3 lakh tons. A study of the table below may be of interest:—

PRODUCTION OF CASTOR SEED

(In '000 tons)

	1938	1948	1949
India	125	109	120
Brazil	40	170	250
Indonesia	10	10	10
Russia	80	80	80
Total (including others)	300	300	500

One significant fact which emerges from a study of the above table is that the production of castor seed in Brazil has shown a big increase during the last few years. In 1949, the total production in that country was slightly more than six times the pre-war production.

Soya bean grows in soils where cotton and maize are cultivated. Generally it grows best on rich loamy soils. It is sown in summer and harvesting begins from December.

Manchuria is the largest producer of soya beans in the world. Other producers are Japan, China, India and the U. S. A.

SOYA BEANS

(In millions of metric quintals)

China	50·2	Korea	4·9
Manchuria	33·5	Japan	2·8
U.S.A.	10·8	Indonesia	2·0

At the present time, soya bean has acquired a great commercial importance. Beans supply meal, oil, green beans and dried beans.

USES OF SOYA BEANS

Meal—Breakfast foods, flour, soya milk, soya sauce, cakes, pastry, etc.

Oil—Glycerine, enamels, varnish, linoleum, celluloid, lubricants, candles, rubber substitutes, etc.

Green Beans—Green vegetables, salads, etc.

Dried beans—Soup, vegetable milk, coffee substitutes, boiled beans, etc.

QUESTIONS

1. What are the necessary conditions for the production of the following—(*a*) Rubber and (*b*) Beet? Name the principal countries in which these are produced. —(Cal. Inter. 1927).

2. Describe the geographical circumstances favouring the growth and the world distribution of sugar-beet and sugar-cane. —(Cal. Inter. 1931, 1933, 1941).

3. What are the necessary conditions for the successful cultivation of cotton? Describe carefully the regions where it is produced in India and the measures adopted for improving the quality and quantity. —(Cal. Inter. 1931).

4. Into how many classes is cotton divided? Give a short account of the chief sources of supply of the principal varieties of cotton. —(Cal. Inter. 1936).

5. What are the climatic conditions favouring the growth of coffee and tea? What are the principal countries of production and export? —(Cal. Inter. 1934).

6. Examine the importance of any four of the following crops in India: (*a*) Cotton, (*b*) groundnut, (*c*) jute, (*d*) linseed, (*e*) rice and (*f*) wheat. —(Cal. Inter. 1934).

7. What are the main sources of supply of rubber and what countries control these sources? What are the possibilities of India's becoming an important rubber-producing country? —(Cal. B. Com. 1926).

8. Name the most important rice-importing countries of the world. From what sources is rice imported into Great Britain and to countries of North Europe? What is the present position of India including Burma in this trade? —(Cal. B. Com. 1930).

9. Name the places where the following are grown: (*a*) sugar, (*b*) coffee, (*c*) flax, (*d*) India rubber and (*e*) tobacco. —(Cal. Inter. 1924).

10. What are the natural conditions required for the cultivation of cotton? What countries export cotton and to what destination? —(Cal. Inter. 1925, 1951).

11. Give an account of the World distribution of rice and wheat and indicate in this connection the geographical factors leading to the successful cultivation of these crops. —(Cal. I.A. 1951).

12. Compare and contrast the physical and economic factors associated with the production of rice and wheat. Mention the chief countries and ports engaged in the foreign trade in these commodities. —(I. P. S. 1934).

13. What conditions are necessary for the successful cultivation of beet and sugar-cane? State accurately the areas in which sugar is manufactured. India produces large quantities of sugar-cane, but still imports sugar from other countries. Why? —(I. P. S. 1930).

14. Discuss the conditions favouring the growth of (*a*) jute, (*b*) oilseeds, (*c*) coffee and (*d*) sugar-cane. —(Cal. Inter. 1935).

15. What climatic conditions are favourable or unfavourable to the cultivation of rice, cotton and sugar-cane? Explain fully the reasons. —(Cal. Inter. 1940).

16. What are the climatic conditions which favour the growth of the following products :—(*a*) coffee, (*b*) sugar and (*c*) wheat? Mention the different countries from which they are principally exported. —(Cal. Inter. 1949).

17. State the essential features of the distribution of wheat, rice and sugar-cane in the British Empire. Examine the position of each one of them in international trade. —(I. T. B. 1940).

18. Since 1933 the declining tendency of the prices of tea has been arrested and at present the tea market is ruling quiet. What factors happened to be responsible for this improved position of the industry? What steps, in your opinion, should be taken by the industry so that the improvement now visible may be of a lasting character? —(Cal. B.A. Hons. 1941).

19. Name the principal silk-producing countries of the world. Do you think that artificial silk is seriously competing with natural silk? —(Cal. B. Com. 1937).

20. Describe and account for the location and importance of sugar-beet-producing regions of Europe. —(Cal. B.A. 1942).

21. Discuss the supply and demand position of the principal cereals in the world to-day. What is the main cause for the mal-distribution of these commodities over the consuming countries, and how can it be removed? —(Cal. B. Com. 1943).

22. What are the necessary conditions for the production of (*a*) Rubber and (*b*) Beet? Name the principal countries in which they are produced. —(Cal. Inter. 1945).

23. Name the principal rubber producing countries of the world. Do you think synthetic rubber can compete with natural rubber? —(G. C. I. Cal. 1950).

*24. Describe the geographical conditions necessary for the successful cultivation of tea. Discuss the supply and demand position of tea in the world today. —(Delhi U. B.A. Hons. 1951).

CHAPTER IV

MINING

Mining is an industry in which minerals are extracted from the womb of the earth for the use of man. Minerals are used as raw materials for various industries. Modern civilisation is, in many respects, dependent on mineral products. Machines, ships, armaments, buildings, coins, nay, everything connected with modern civilised life are more or less associated with minerals. No nation has within its borders all the various minerals required by its industries. Hence all are bound together by a chain of economic dependence on one another in respect of various minerals. No part of the world can be inhospitable for the seekers of minerals.* The hot deserts of Australia and South Africa and the cold desert of Alaska have developed along with the discovery of minerals. When the gold-mine of the Servard Peninsula, near the Arctic Circle (Alaska), had been discovered in 1897, a regular goldrush began. Unlike agricultural crops, mineral product is fixed in quantity ; it cannot be increased or replaced. Once the minerals are extracted from the earth, they are gone for ever. Mining is, therefore, a kind of robbery, because it takes away something which it cannot give back. It robs Nature of her products. Minerals are decreasing rapidly and, in future, civilisation may be threatened by their shortage. Already shortage in mineral resources is being felt in the Western Hemisphere, chiefly the countries round North Atlantic border. Since 1914 so much minerals, in particular basic metals, have been used up that situation has become almost critical in respect of tin, lead and zinc. The deposits of copper, nickel, manganese, wolfram and antimony are also diminishing and new discovery is not keeping pace with demand. The outlook, however, for Eastern countries is less grave because the mineral wealth is yet to be tapped here in many regions. But in near future there will be demand in the Eastern countries for metals in unprecedented quantities from the industrially developed countries because many Eastern nations have made development plans for industrialisation, agricultural development, mechanised transport and hydro-electric schemes all of which will bring about a revolutionary rise in the East's demand for metals from a few hundred thousand tons to several million tons.

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* The present climatic conditions have no relations to the existence of minerals which may be found in hot lands, polar regions or any other climatic region. Man cannot choose his mineral to suit his climatic surroundings.

Minerals may be classified into—

(a) *Metallic minerals.*

Iron, copper, lead, tin, zinc, aluminium, silver, gold, mercury, antimony, platinum, manganese, nickel, chromium, cobalt, tungsten and vanadium.

(b) *Minerals used as fuel.*

Coal, petroleum and natural gas.

(c) *Structural materials.*

Cement, stones, lime, asbestos, asphalt, gypsum, clay, and sand and gravel.

(d) *Minerals used chemically.*

Salt, sulphur, potash, magnesite, dolomite, etc.

(e) *Minerals for miscellaneous uses.*

Talc (soap-stone), mica, precious stones, graphite, quartz, fuller's earth, etc.

Gold :—It is used mainly for coinage and for the manufacture of jewellery, and as such it is exceedingly valuable. The influence of gold on human life is great. The hunger for gold has led to the great development of South Africa and Alaska and in each of these areas marked movements of population followed the discovery of gold.

Gold is widely distributed throughout the world, but a few countries produce it in great bulk. The considerable inequalities in production are of less actual importance than the still greater inequalities in possession and in resources for acquisition in other ways than by production.

More than 50 p.c. of the total production of gold in the world comes from the Union of South Africa, which is undoubtedly the greatest producer in the world. The development of South Africa is mainly due to the discovery of gold-fields. The construction of the lines of communication and the planning of many towns and cities have been mainly aimed at the exploitation of this product. It is, therefore, said that "Gold mines are the backbones of South Africa". The region in which it is mined is the ridge of the northern rim of the hills that separate the basins of the Orange and Limpopo. This ridge is called the *Witwatersrand* (or simply Rand). The Rand gold-fields were discovered in 1885 .

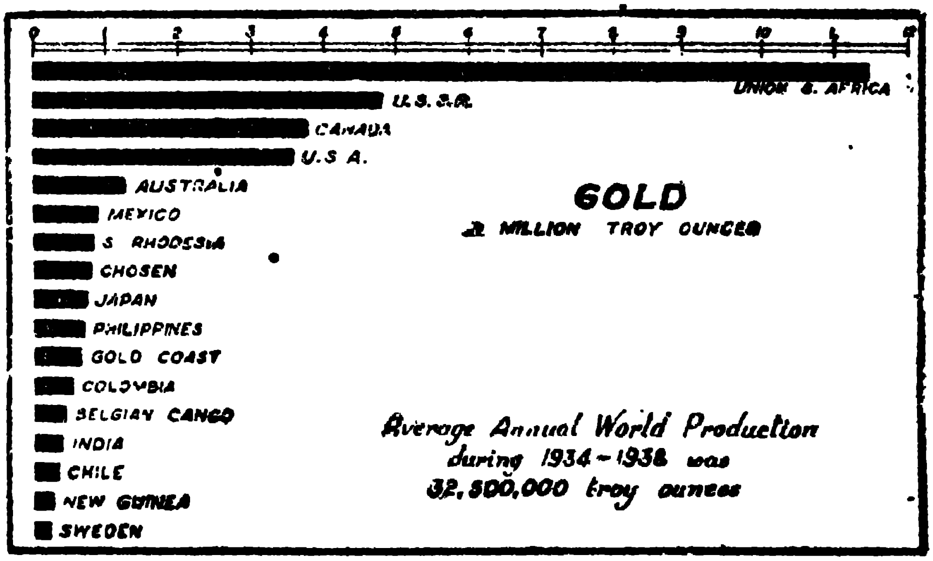

FIG. No. 25. World gold output in 1949 was about 24·9 million fine ounces, or 700,000 ounces higher than in 1948. The rise was mainly due to increased output in Canada and South Africa, that for other countries showing little variation. The Union of South Africa accounted for over 40% of the total production. Canada, U.S.A. and U.S.S.R. are the other important producing areas.

The Rand industrial zone of S. Africa mainly depends on gold. The largest Rand towns are Johannesburg, Germiston, Benoni, Booksburg and Krugersdrop. All these towns are connected by railways and are situated within 70 miles of Johannesburg, east and west. Nearly one-sixth of the Europeans of the Union or one-half of those of the Transvaal have settled in the "City of Rand".

To the west of Johannesburg, gold is found in the rocks of the ridge. The rocks have to be crushed to obtain the gold. The gold mines are worked there with considerable difficulties, for labour is scarce, transportation facilities are inadequate and the climate is hot. At present a large number of labourers is brought from India and China to work the mines on the *compound system.* Under this system, the labourers sign on for definite periods during which they live in compounds where they are fed and housed by the mining companies.

In 1950 the Union of South Africa produced 12 million ounces of gold from its mines in Transvaal. Cape of Good Hope, Natal and Orange Free State raised £100,000 worth of gold in the same year.

Southern Rhodesia supplied 5,000 ounces of gold in 1950. In Belgian Congo, the bulk of the production comes from the Kilo-motor mines. In 1947, the Belgian Congo produced 300,000 ounces of gold.

Gold is found in many parts of North America. The whole region from Alaska in the far north to Mexico in the south is rich in gold. The chief gold areas of North America are—

1. The Yukon basin of Alaska (the centre is Klondike).
2. British Columbia (the Fraser and Columbia basins).
3. California.
4. The plateau of Idaho.
5. The Eastern Rocky field (the Montana and Dakota).
6. The plateau of Colorado and Arizona.
7. Eloro in Mexico.

More than one-fourth of the world's gold supply is raised in North America. Recently a few gold fields have been discovered in Ontario in Canada and there are still many to be discovered. The production of gold in Canada in 1948 was about 3·5 million fine ounces.

Gold is the most important mineral product of Australia where it is found practically in all the States. In Australia gold discoveries were made in 1851. This led to an amazing influx of migrants. From 400,000 population in 1850, the figure rose to 10,00,000 by 1858. The richest deposits are, however, found in Western Australia, Queensland and Victoria. Ballarat and Rendigo are the two chief gold-producing districts of Victoria. In Queensland the chief mining centres are Charlestown and Mt. Morgan. Western Australia has rich supplies of gold in Coolgardie and Kalgoorlie. In 1948 Australia raised 1·2 million fine ounces of gold, valued at £16 million.

In India the greater portion of the gold produced comes from the Kolar fields in Mysore. In 1947, the Kolar gold-fields raised about 172,000 fine ounces of gold. Small production is

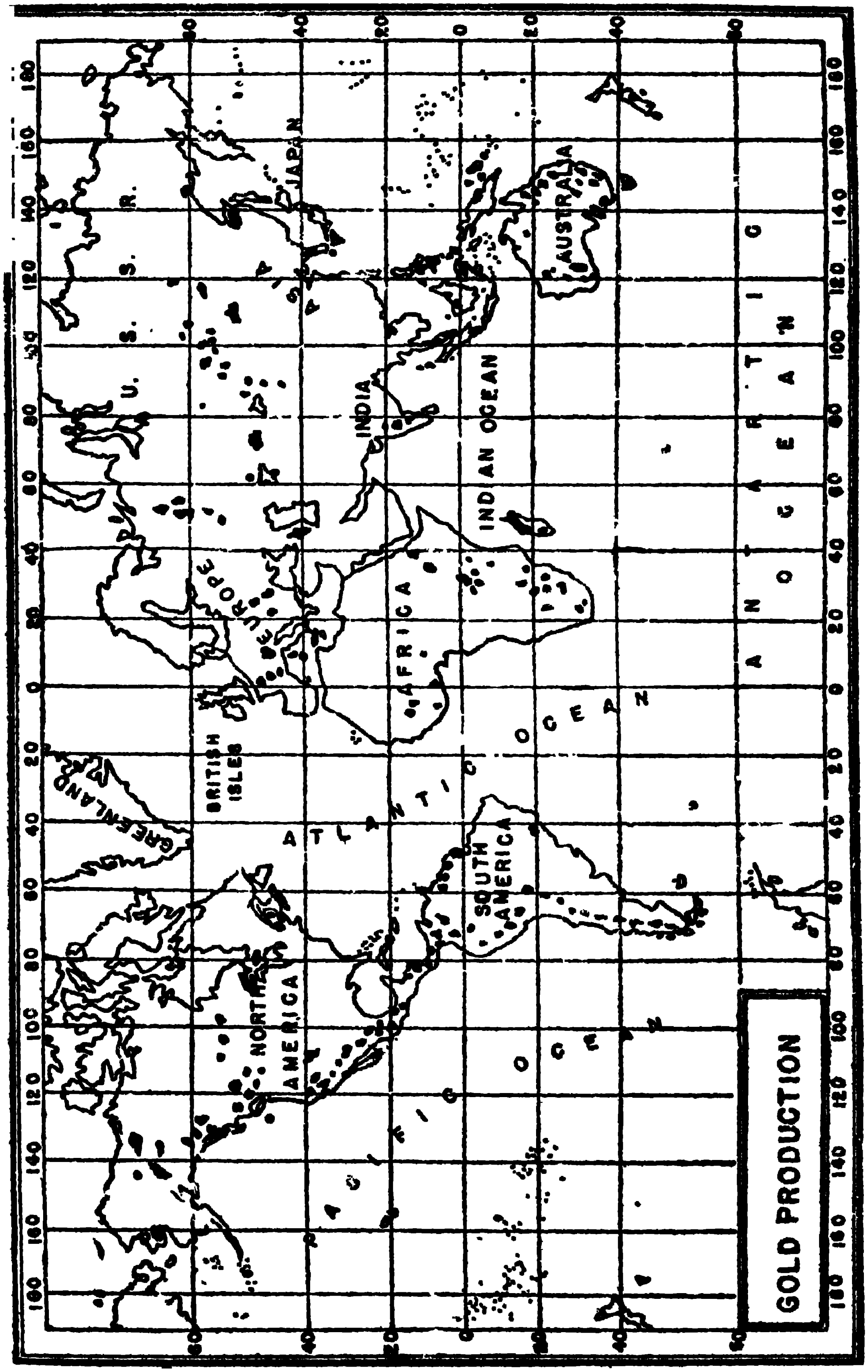

FIG. No. 26. Distribution of gold production. Note the gold-bearing regions in North America from Alaska to Mexico.

also obtained from the Bellara mine 60 miles west of Bangalore. Burma produces a small quantity of gold, mostly extracted from alluvial deposits.

The position of the British Commonwealth as producers of gold is unassailable as they control territorially and financially more than 60 p.c. of the gold resources of the world.

Silver :—It is obtained native, and also in combination with other metals the chief of which are gold, lead and copper. Now-a-days most of the silver produced is a by-product of some other metals, and, therefore, its output is an index of the mining of those metals. Silver is used in the manufacture of ornaments, table utensils and coinage and also for plating base metals.

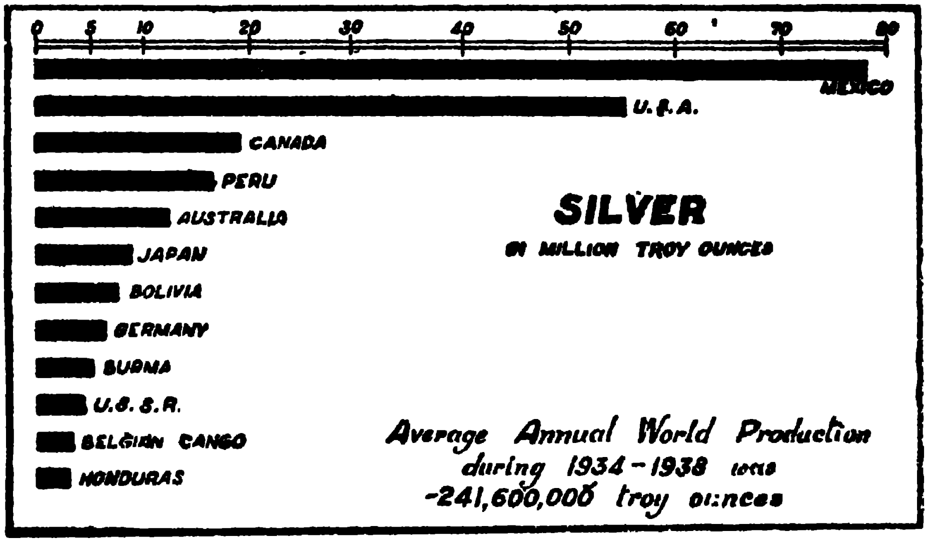

FIG. NO. 27. In recent years, the production of silver has considerably declined in most of the countries. Thus in Mexico the silver output was about 60 million ounces in 1950 compared to 78 million in 1941.

The position of the British Commonwealth in respect of silver production is not very satisfactory. Only a little more than one-sixth of the world's silver resources is controlled by it.

North America produces more than two-thirds of the world production. The whole mountainous range of the west from the U.S.A. to Chile in South America is rich in silver. Mexico is the leading producer of silver and she mines nearly more than one-third of all the world's output of new silver. Most of the silver mines are in Pachuca in the State of Hidalgo although the State of Chihuahua also raises a considerable quantity.

The prosperity of Mexico depends mainly on the production of silver and its price in the international market. In 1948 Mexico raised 46 million fine ounces of silver. The output of U.S.A. in the same year was about 35 million fine ounces. In the U.S.A. silver mines are worked in Idaho, Montana, California, Utah, Texas, Colorado and Arizona. Canada is the fourth greatest producer. More than half of the silver produced in Canada is obtained from Ontario, and the rest from British Columbia. The production of silver in Canada for 1947 was 11 million ounces. In Peru the silver deposits are found along with lead and copper ores in the mines of Cerro de Pasco. In Peru the working of mines frequently suffers from political disturbances. With the restoration of stable government, it is expected that production will increase in that country. At present it contributes about 8 p.c. of the world's total supply.

In Europe, the production of silver is about 20 million fine ounces. The leading producers are Germany, Russia and Jugoslavia, and also a small output is obtained from Spain.

Australia is very rich in silver ; large deposits are found in New South Wales and Western Australia. In 1947, the output of silver in Australia was estimated at 9 million troy ounces.

Japan and India are also producers of silver. In India there are no silver mines ; it can only be found as a by-product in the mining of gold, lead, tin, etc. Almost the entire silver supply of India is obtained from the Kolar Gold-Fields of Mysore.

As the production of silver is increasing rapidly, the price-level of the metal is going down. In 1933 Mexico, U.S.A., Canada, Australia and Peru made an agreement to restrict the output of silver with the object of stabilising its price.

Platinum :—It is a valuable metal used in photography, dentistry, in the electrical and jewellery business and in X-ray works. It is also used in the manufacture of handbags, cigarette cases, pocket lighters and knives. During recent years its use in the setting of diamond has increased considerably. Russia has long been the chief producer, and though recently surpassed in production by Canada, it still has a reserve of many million ounces.

U.S.S.R. is the leading producer of platinum and contributes more than one-third of the world-production. Canada is the second largest producer and its production of platinum in 1947 was 95,000 troy ounces. Most of the Canadian output is raised in British Columbia and Ontario. Russia has rich deposits of platinum in the Ural mountains. In South Africa, the principal deposits are in the Waterberg, Lydenberg and Rustenburg districts of the Transvaal. U.S.A. and Australia also produce platinum.

Osmium and iridium are metals akin to platinum. These are produced mainly in Canada.

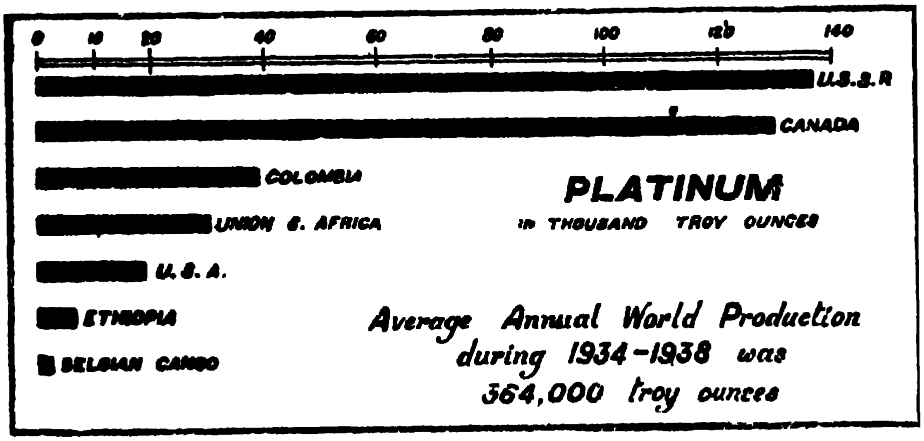

FIG. No. 28.

Lead :—It is very commonly found in association with zinc or silver, and is used for a variety of purposes in industries. Lead commands demand for paints, glassware, typewriter, automobiles, aeroplanes, locomotives, printing industries, musical instruments and bullets.

The leading producer is the U.S.A. where it is found in Missouri, Idaho, Oklahama, Colorado, Montana, Nevada, Utah, New Orleans and New Mexico. In spite of the fact that production in the U.S.A. is much larger than in any other country in the world, her domestic requirements are so great that supplies are often drawn from other producing countries, *e.g.*, Mexico, Canada, Spain and Australia. U.S.A. normally consumes about 35 per cent of the world production of lead against her production to the extent of 30 per cent of the world's total.

Production of lead during 1950 at the world's mines (excluding those of China, Poland, Portugal and the U.S.S.R.)

totalled 1·5 million metric tons, compared with 1·4 million metric tons in 1949. World production of primary lead from smelters in 1950 (excluding those in the U.S.S.R.) was 1·6 million metric tons, compared with 1·5 million in the preceding year. Nearly three-quarters of the output of primary lead was smelted in five countries: the United States, Mexico, Australia, Canada and Germany.

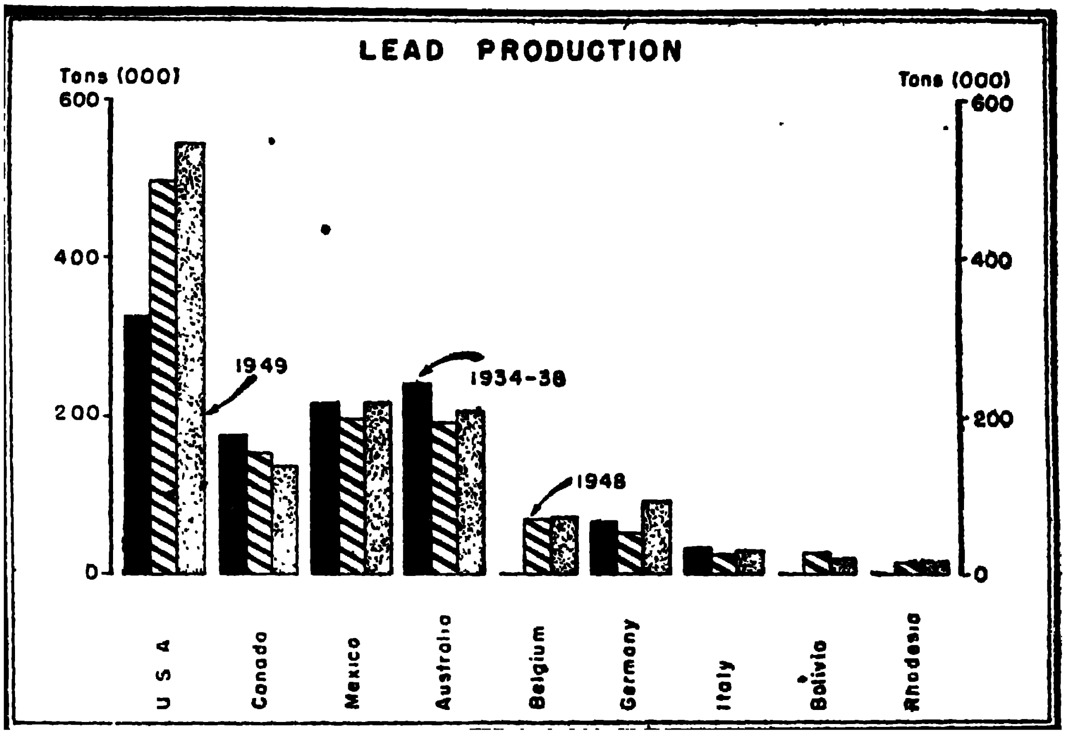

FIG. NO. 29.

LEAD: PRODUCTION* IN SELECTED COUNTRIES, 1949 TO 1951

(*Thousands of metric tons*)

Country	1949	1950	1951†
United States * ..	433·0	461·1	410
Mexico	212·0	230·8	230
Australia	187·3	203·2	200
Canada	132·6	154·6	147
Germany, western ..	97·5	118·1	120

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* Production of primary lead by smelters.
† Estimated.
Source: Statistical Office of the United Nations.

Zinc :—Zinc-ore is generally associated with lead and copper ores and is used to coat or galvanise iron in order to prevent rusting. It is also used in the manufacture of paints.

CHIEF ZINC-ORE-PRODUCING COUNTRIES IN 1947

(*Long tons*)

U.S.A.	570,000	Italy	50
Australia	182,000	U.S.S.R.	105,000
Canada	185,600	Yugoslavia	47
Germany	136	Spain	33
Mexico	193,000	Sweden	30
Newfoundland	67	N. Rhodesia	21

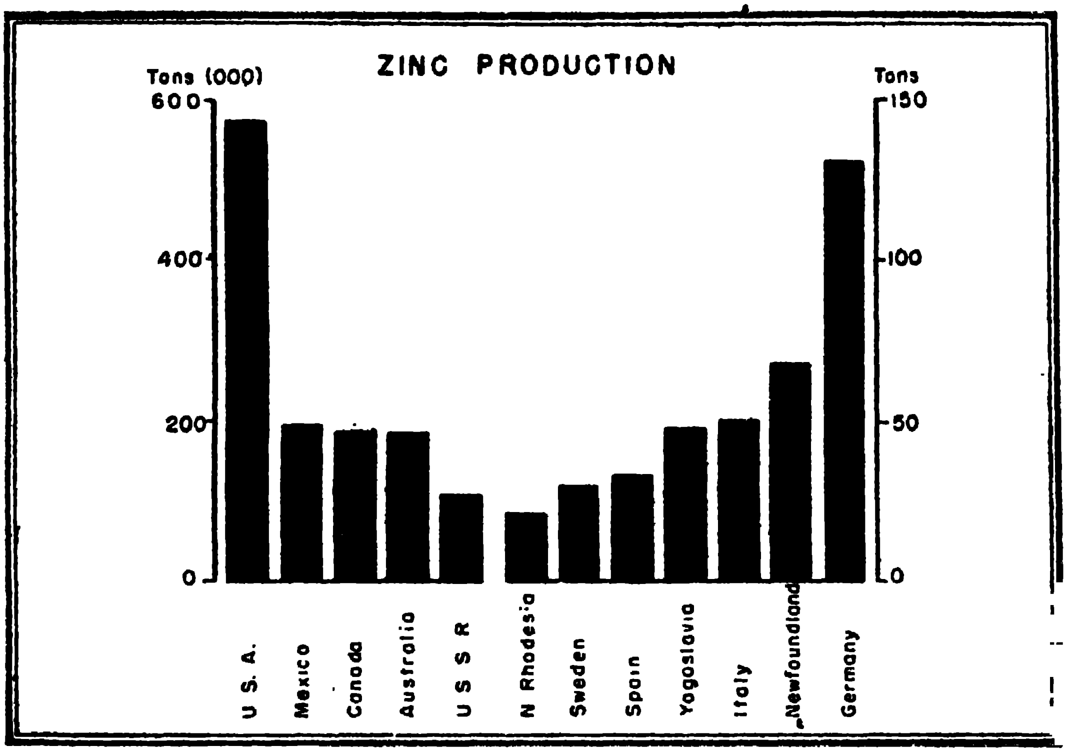

FIG. No. 30.

U.S.A. surpasses every other country in zinc production and contributes about 30 per cent of the world's supply. Oklahama, New Jersey, Kansas and the Utah are the principal sources of supply. As a result of some recent discoveries of zinc mines, Australia has become the fourth largest producer. Canada is a close rival of Australia. Northern Rhodesia contains large deposits of zinc ore, though present production is insignificant.

The production of zinc ore in the world (excluding China, Poland and the U.S.S.R.) in 1950 amounted to 1·9 million metric tons (zinc content), which was 200,000 metric tons higher than output in 1949. Four major producing countries—Australia, Canada, Mexico and the United States—together accounted for two-thirds of this production.

The principal exporters of zinc are Australia, Belgium and the Belgian Congo, Canada, Italy, Mexico, Norway, Peru, Spain and Sweden.

Copper:—Copper usually occurs in combination with silver, gold, iron, lead and sulphur. The demand for this metal is considerable, for it is largely used in the electrical industry. Mixed with zinc, it produces brass ; with tin, bronze ; and with nickel, German silver.

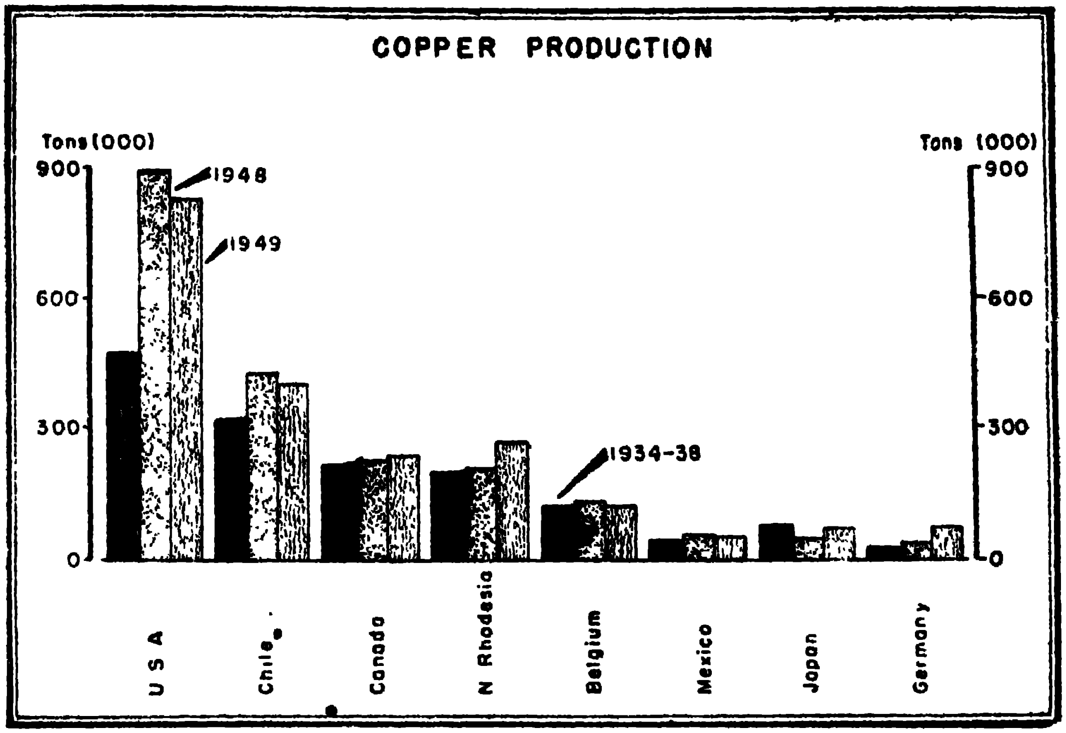

Fig. No. 31.

In the U.S.A. the copper ores are found in Montana, Arizona, Nevada, Colorado, Utah and Lake Superior Coast. The greatest copper-producing area in the world is the Butte district (Montana) in U.S.A. The second largest copper-producing district in the U.S.A. is the Lake Superior district where the mines are located in the vicinity of Houghton.

U.S.A. produces more than 20 p.c. of the world's total. In 1950 it contributed more than 40 p.c. of the world production. The production of copper in the U.S.A. for 1942 was about 2 million short tons.

Chile is the world's second largest producer of copper. The reserves of copper in Chile are vast and are estimated to contain about one-third of world's reserves. In Asia the position of Japan in respect of this metal is very enviable. Normally, Japan raises about 5 p.c. of the world's output of copper. Most of the copper mines of Japan are in Honshu. Osaka is the chief smelting and refining centre. India also produces a small quantity of copper.

The production of copper in Europe being insufficient for her requirements, import from overseas is of considerable magnitude. The principal copper-producing countries of Europe are Spain, Germany and Norway.

Although the British Commonwealth has increased her production enormously within recent years, her contribution is only 8 p.c. of the world's total. This quantity is not sufficient to meet the requirements of the Empire. Canada ranks third in copper production. Northern Rhodesia raises an appreciable quantity. In 1950 Northern Rhodesia raised 280,000 metric tons of copper out of Africa's total of 500,000 metric tons.

Recent explorations have proved that the Katanga deposit in Belgian Congo is one of the richest in the world. What gold and diamond have been to South Africa, copper promises to be for Congo. The difficulty of securing labour and the excessive cost of transportation tend to check rapid development. The other important producers are Mexico, Cuba and Peru.

From 1935 to the outbreak of the World War II the world market of copper was controlled by an International Copper Export Cartel, whose members included the U.S.A., Canada, Peru, Mexico, Chile, Belgian Congo and Rhodesia.

During 1950 the output of copper ore in the world (excluding the U.S.S.R.) was nearly 2·3 million metric tons (copper content), over 10 per cent higher than the output in 1949 ; this represented the highest annual production since 1944. Five countries accounted for 84 per cent of this production: the United States, 37 per cent; Chile 16 per cent; Northern Rhodesia, 12 per cent; Canada, 11 per cent; and the Belgian Congo, 8 per cent.

Aluminium :—It has become very important in these days of aviation. Fifty years ago, its importance was practically nil. It is also used in motor cars, railway carriages, electrical and armament industries.

Aluminium is extracted from bauxite and cryolite. France, Dutch Guiana, Gold Coast, British Guiana, Hungary and the U.S.A. produce bauxite. Cryolite is found only in Greenland. Though the Government of Greenland restricts the production of cryolite according to budget requirements, it has never shown the least sign of differentiating between foreign customers. Cheap power is necessary for smelting aluminium ore.

BAUXITE-PRODUCING COUNTRIES IN 1947

(In 1000 tons)

U. S. A.	1250	Gold Coast	96
U. S. S. R.	500	Br. Guiana	1369
France	669		
Italy	165	Indonesia	400

The world production of bauxite in 1947 was about 6 million metric tons as against 490,000 metric tons in 1937.

The United States is now the largest producer of aluminium and aluminium products in the world. It raises more than 30 per cent. of the world's total output of the aluminium ore, and consumes about 40 p.c. of the world's total.

The present American output of primary aluminium is at the rate of 650,000 short tons a year. Much of the U.S.A. consumption represents re-armaments. Canada produces aluminium at the rate of about 350,000 short tons annually. The Canadian output can be further increased. A new plant is being erected in British Columbia for aluminium production. The U.K. aluminium production is relatively small, about 30,000 tons a year, and is operating at capacity. Britain depends mainly on Canada for this metal. Canada is the world's largest exporter of aluminium. In 1950 it exported 304,600 metric tons of unwrought aluminium, or about 85 per cent of its production. Of these exports, 48 per cent went to the United States and 41 per cent to the United Kingdom.

The modern method of extraction has greatly increased the output of this metal, and consequently prices have been reduced. As a metal it is light, tough and non-corrosive. Aluminium can be easily manufactured where power is cheap. In France, Germany, Norway and Italy it is worked very advantageously because water-power is available at a low cost.

Increases in production facilities are projected in Australia, India and Norway, and the possibility of developing aluminium production in North Borneo and the Gold Coast is being investigated.

Tin :—This metal is useful in manufacturing packing cases, tin roofing and many other articles. Tin has considerable demand in fish and meat-packing centres. The principal countries noted for tin production are Malaya, Bolivia, Great Britain, Indonesia, China, Germany, U.S.A., Australia, Nigeria and Belgian Congo.

In Malaya, the deposits have been worked at Perak, Selanger, Pahang and Negri Sembilan, the first two furnishing 90 per cent. of the total. Small deposits are also located in Johore, Kedah, Kelantan, Perlis, and Trengganu. Tin mining and smelting is Malaya's premier industry. About 70 p.c. of the tin production of the Federated Malaya States comes from European-owned mines and 30 p.c. from Chinese-owned properties. The smelting of tin is the virtual monopoly of the British companies at Singapore and Penang. The British companies have not only monopolised the smelting of tin ore mined in the Malaya States, but they also treat large quantities of ore imported from Burma, Thailand, Indonesia, Japan, Australia and Africa. "British dominance of the world's tin-smelting industry has been maintained by the imposition of prohibitive export duties on tin ore exports from Malaya except when destined to be smelted in U.K. or Australia." The tin-deposits of Indonesia are of considerable importance. Most of the deposits are in Banka, Sumatra, Singkep and Billiton.

TIN IN CONCENTRATES : PRODUCTION IN SELECTED AREAS, 1937 TO 1952

Area	1937-41		1942-46		1947-51		1951	
	Metric tons	Per cent of total	Metric tons	Per cent of total	Metric tons	Per cent of total	Metric tons	Per cent of total
WORLD TOTAL	207,317	100	108,841	100	154,116	100	167,100	100
Malaya, Indonesia and Thailand.	121,654	59	25,590	24	84,105	54	99,200	59
Bolivia ..	32,130	15	40,138	37	34,424	23	33,700	20
Belgian Congo & Nigeria.	21,970	11	28,415	26	22,854	15	21,700	13
Other areas ..	31,563	15	14,698	13	13,233	8	12,600	8

About 60 per cent. of the world's total tin supply is obtained from Malaya and Indonesia. In Bolivia the proper development of this metal is subject to many handicaps, specially the absence of communications. Most of the tin mines of Bolivia are found at altitudes above 12,000 feet. British Commonwealth is in a very strong position so far as this metal is concerned, as it controls more than 40 per cent. of the total supply. The world production of tin in 1951 was 167,100 tons of which British Commonwealth raised 43,000 tons.

The greatest consumer of tin in the world is the U.S.A. where the meat-packing industry is practically dependent on the supply of tin imported from foreign countries.

Mercury or Quicksilver :—The chief use of this ore lies in the fact that it is employed in the extraction of gold and silver from the ore. It is also used in the manufacture of thermometers and barometers, in medicine and ointment, and the silvering of mirrors.

In 1947, Italy produced about 2,000 long tons of mercury. Although mercury is found widely distributed throughout Italy, the principal deposits are in Tuscany, the Idria and Trieste. In Spain, the deposits are found in the Almedan mine in the province of Ciudab Real and in Granada and Oviedo. Spain produced 1,324 tons of mercury in 1947. The chief States of the U.S.A. supplying mercury are, in order of importance, California, Oregan, Texas, Nevada, Washington and Arakansas. The production of mercury in the U.S.A. in 1947 was 790 tons. In Russia, mercury is mined at Nikitova in the Donetz basin. There are a number of small mercury mines in Mexico, but the production is very small, because of political disturbances and labour troubles.

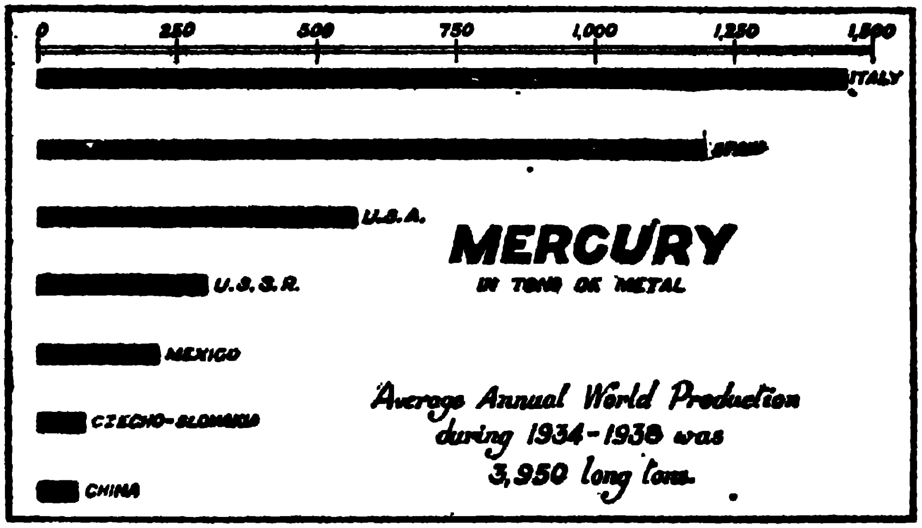

FIG. No. 32. In 1947, the world production of mercury was about 5,312 tons with Italy as the chief producer.

Iron* :—Iron is by far the most useful of all the metals. The success of almost every industrial enterprise depends upon the extensive and efficient use of machinery and other economic equipments made wholly or in part from iron and its alloys. "Leadership in industry and trade demands an abundant and efficient use of mechanical equipment which in turn necessitates a plentiful supply of iron and coal."

The value of an iron ore deposit depends not only upon its richness in iron, but also upon its location and the ease or difficulty of mining. Some of the richest iron ore deposits of the world are at present of little economic value because of their remoteness from the great industrial centres and the resultant expense in transporting them to the places where they may be utilised. This is specially true of the great iron ore deposits of Southern Brazil which contains the largest reserves of iron ever discovered. Many impurities occur in combination with iron ore which are to be removed from the ore. Usually coke and limestone are mixed with iron ore and heated to high temperature. Limestone absorbs the impurities of the ore. The metal thus obtained is known as pig iron. The pig iron is smelted in areas where coke is available in plenty. From pig iron is manufactured steel of various kinds by mixing with it chromium, manganese, tungsten, vanadium, nickel etc., either for hardness or brightness.

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* It is hardly found in metallic form but in some chemical combination such as (*i*) hematite, red or gray iron oxide, (*ii*) magnetite, black magnetic iron oxide, (*iii*) siderite, iron carbonate and (*iv*) limonite, brown hydrous iron oxide.

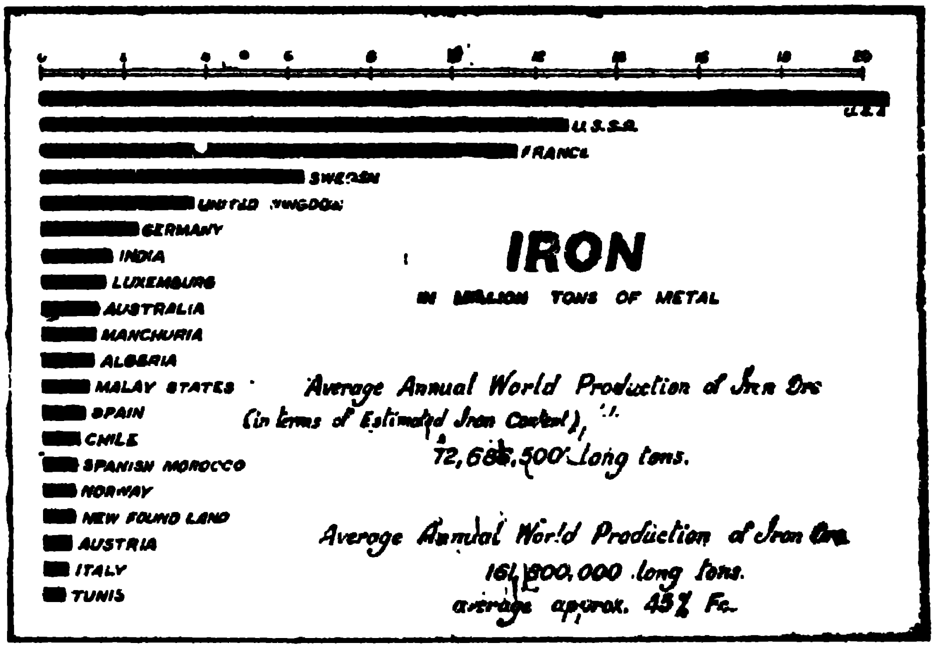

FIG. NO. 33.

Since iron is obtained from the ore by the use of coal in the form of coke, its mining is very much confined to regions where these two minerals are found together. It is important to note that the North Atlantic basin (the eastern U.S.A. and the western Europe) contains these two minerals in close proximity to each other. *These two regions therefore have the world's leadership in the production of heavy iron and steel manufacture.*

Iron ore deposits are scattered all over the world, but the important ones are found in the U. S. A., France, U. S. S. R., Great Britain, Germany and Luxembourg.

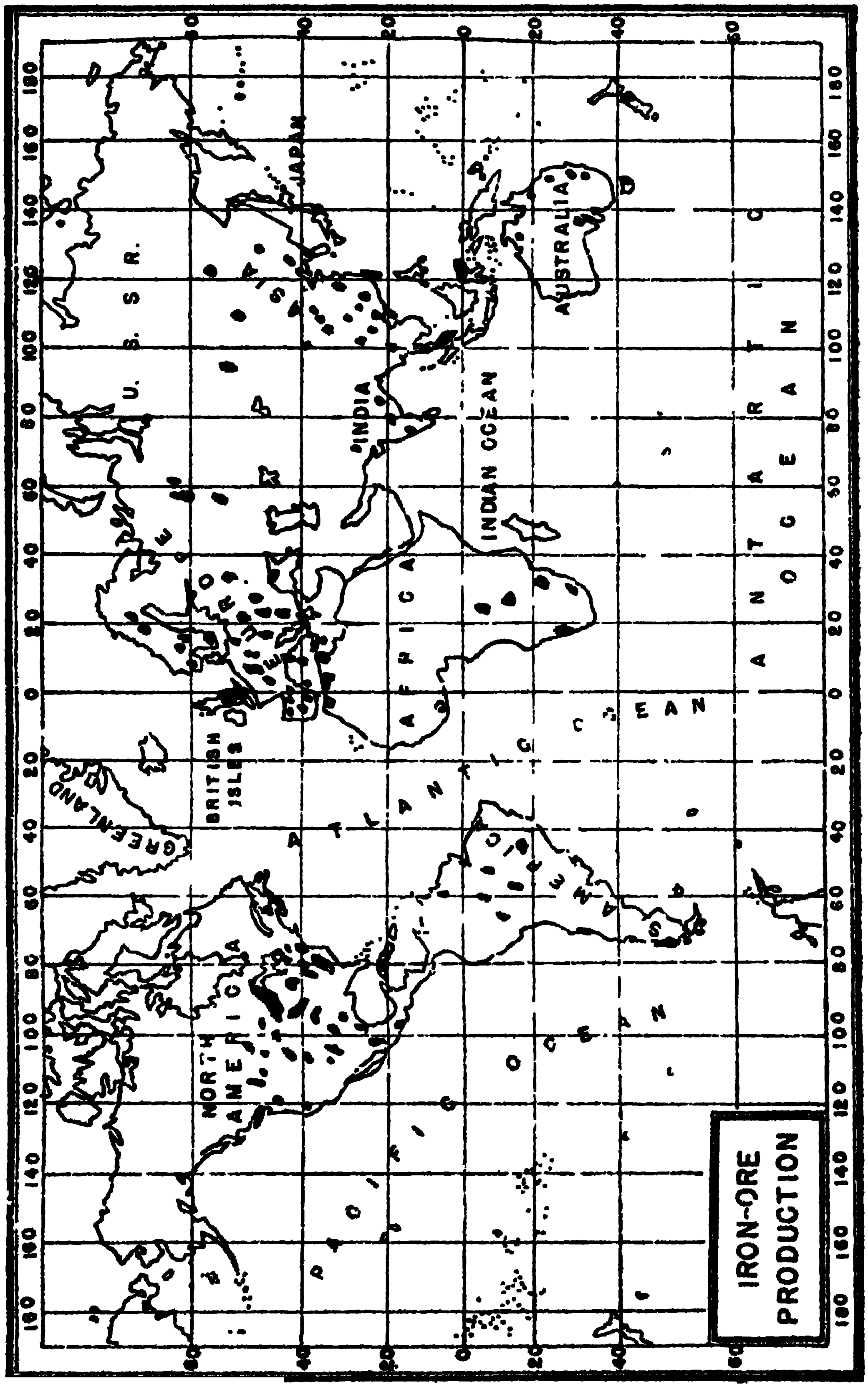

Fig. No. 34. Distribution of iron-ore production. Note the chief iron-ore-producing regions in the U.S.A. and Western Europe.

IRON ORE: PRODUCTION, 1947 TO 1951

(Millions of metric tons; iron content)

Area	1947	1948	1949	1950	1951
Estimated world total ... ... (Excluding U.S.S.R.).	76	87	85	93	104
Chief producing countries :					
United States	48	51	43	49	61
France	6	8	10	10	12
Sweden	6	8	8	8	10
United Kingdom	3	4	4	4	4

IRON ORE AND CONCENTRATES: INTERNATIONAL TRADE, 1950

(Thousands of metric tons)

Destination	Exporting countries					
	Sweden	France	Chile	Algeria	Brazil	Spain
Belgium-Luxembourg ..	1,517	6,869	...	...	...	14
United Kingdom ..	3,497	366	...	1,505	...	729
United States ..	2,070	...	2,612	502	703	...
Germany, western ..	3,754	399	...	...	...	61
Netherlands ..	208	170	...	177	43	116

U. S. A. raises nearly one-fourth of the total production of iron ore of the world. There are three principal belts in the U. S. A. producing iron ore—(*a*) the Mesabi range in Minnesota, (*b*) peninsular Michigan and (*c*) the Appalachians. The Alabama district in the Appalachians, though it produces a large quantity, suffers from its situation at a great distance from the ports. Despite its enormous production the U. S. A. imports considerable quantities of iron ore from Chile, Cuba, Sweden, Spain and French Africa. The production of iron ore in the U. S. A. for 1950 was nearly 50 million metric tons.

In the **United Kingdom** the bulk of iron-ore supply comes from Yorkshire, Lincolnshire, Northamptonshire, Cumberland and North Lancashire, which provide the country with two-thirds of her requirements of ore. The United Kingdom raises about 5 per cent of the world production of iron ore. **France** obtains the bulk of her iron ore from the Lorraine Fields, which is the richest area in iron-ore in all Europe. Normandy and the Pyrenees are the two other areas of France noted for iron-ore. Before 1919 **Germany** was the leading producer of iron-ore in Europe. The loss of Lorraine and Luxembourg was a staggering blow to Germany because these two places used to supply 75 per cent. of the country's total output. At present Germany obtains her supplies from Vogelsburg, Sudetan lands, south-east of Silesia, northern slopes of the Erzebirge (Saxony), Westphalia, the extreme east of the Alpine zone in the province of Styria and Austria. **Norway** has a considerable production of iron-ore in the north—almost in the Arctic Circle. Large deposits are also available in Central and Southern Norway. In **Sweden,** the ores are not abundant but they are noted for their high quality and contain 65 per cent iron. In Sweden, valuable deposits are found at Kiruna and Gellivare in the north and at Dennemora in the centre. **Spain** is fortunate in having large deposits of iron ore. But the ore is little used in the country and is mostly sent to Germany and Britain. Spain raises about 2 per cent. of the world's iron ore.

Recent surveys of iron resources have revealed new supplies in **Soviet Russia** ; the Donetz basin and Tula are no longer the only suppliers. The principal iron-ore regions are :

1. In the neighbourhood of Kursk.
2. Near Orsk in the Southern Urals.
3. At Telbes in the Kuzmas region.
4. The Murmansk peninsula.
5. The Magnet mountain near Magnitogorsk in the Urals.
6. At Krivoi Rog in the Ukraine. This was the principal iron-ore region before the Revolution.

All these regions have been developed recently as industrial areas because of the great demand for armaments in the war-fronts during 1942-45.

In Africa, iron ore is found in French North Africa, Sierra Leone, Spanish Morocco and Union of South Africa. The continent raised 3·9 million tons of iron ore in 1951.

In Asia iron-ore is found in India, China, and Japan. Though iron-ores are vast in China, the development is very small. The instability of government and the lack of railways and roads have hindered the working so long. The iron-ore of Japan is not sufficient to meet the requirements of her steel industry. There are only two important fields—one at Senin on the east coast of Honshu and the other at Muroran in Hokkaido. Some iron-ore is found in Korea and Formosa, but still Japan imports large quantities of iron-ore from China. Her economic control over Manchuria has greatly benefited the iron and steel industry of Japan, because iron-ore is abundant there. In India the most important iron deposits are in Singhbhum, Keonjhar, Bonai and Mayurbhanj States of Orissa, where recent discoveries include what appears to be a range of iron-ore running almost continuously for forty miles. The most important steel producing centre is Tatanagar. Pakistan has no iron-ore deposits. The use of scrap iron in Pakistan as a source of iron and metal will become important in future.

Although iron ore is mined in some 45 countries of the world, more than 85 p.c. of the production comes from U.S.A., U.S.S.R., France, Sweden, Great Britain and Germany.

WORLD STEEL PRODUCTION

(Million short tons)

	1938	1948		1938	1948
U. S. A. ..	56·6	88·4	Germany ..	19·3	6·0
U. S. S. R. ..	19·6	22·2	Luxembourg ..	2·8	2·7
U. K.	14·5	16·4	Czechoslovakia ..	2·9	2·9
France	4·9	8·0	India	1·0	1·3
Belgium ..	4·3	4·3	World Total ..	148·2	169·5
Canada	1·5	3·2			

In the U. S. A. the noted steel production areas are Minnesota, Michigan, Pennsylvania and Alabama. In Europe the chief belt lies from Northern France through Luxembourg and Belgium into the Westphalia district of Germany. This belt produces most of the iron and steel output of Western Europe. The area is centrally located in one of the finest market regions of the world ; it is served by an excellent network of railways, canals and rivers and much of the area is *undertaken* with coal.

In the production of iron and steel, Great Britain is one of the leading countries of the world. Here iron-ores are found in close proximity to coal. Moreover, nearness to coasts gives her iron easy access to sea. Limestone, which is necessary for smelting, is also found near-by.

Czechoslovakia, Poland, Spain and Italy manufacture some iron and steel. Northern Sweden contains the largest deposits of the high-grade iron-ore of Europe.

IRON ORE RESERVES OF THE WORLD*

(Million long tons)

U. S. A.	10,450	Sweden	2,203
Germany	1,315	India	3,000
U. S. S. R.	2,057	New Foundland	4,000
United Kingdom	5,970	Brazil	7,000
France	8,165	Cuba	3,159

Coal :—It is equally important for commercial and industrial purposes. It is the greatest source of power for manufacturing, mining and transportation. Its great advantage in competition with oil is that it is found in a much bigger variety of places and is generally closer to the centres of large scale industries. Its by-products are equally important for industries. The principal by-products are tar, ammonia, gas, coke, crude oil, benzol, naphtha, sulphur, etc. The production of liquid fuel from coal is becoming increasingly important, and Germany heads the list in this direction. Coal is mined in its perfect state and is thus ready for use immediately on its extraction from the ground.

The value of coal depends upon the degree of its heating power. There are three kinds of coal—lignite, anthracite and bituminous. Lignite is a woody kind of coal, sometimes of a brown colour, and hence known as *Brown Coal.* It contains generally 70 per cent. of carbon. This coal is of inferior type. *Anthracite* is difficult to light, burns with little flame but produces great heat when it burns. It is of the best variety. *Bituminous* coal contains more than 80 per cent. of carbon. It is mostly used as fuel for domestic purposes.

The principal coal-producing countries are U. S. A., Germany, U. K., France, Poland, Russia, Japan, Czechoslovakia, Belgium, China, India and Australia.

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* Zimmermann : *World Resources and Industries* (1951).

COAL: PRODUCTION, 1949 TO 1951

(Millions of metric tons)

Country	Production 1949	 1950	 1951
United States ..	433·2	501·4	519
United Kingdom ..	218·6	219·8	226
Germany	103·2	110·8	119
Poland	74·1	78·0	81
France	65·5	65·9	69
India	32·2	32·8	34
Japan	38·1	38·5	42
Belgium	27·8	27·3	30
U.S.S.R.	234	260	284
World production ..	1479	1605	1691

World production of coal and lignite amounted to almost 1,700 million metric tons in 1951, which was 3 per cent above the 1947 output. The United States was the world's greatest coal-producing country, accounting for 30 per cent in 1951. Production in the United States declined 5 per cent; so that, for the rest of the world, production increased 9 per cent. Greatest increases occurred in Japan (23 per cent), the Bizone of Germany (20 per cent), the Saar (20 per cent), Poland (19 per cent) and Canada (17 per cent).

At present the bulk of the coal production of the world is concentrated in a few of the great industrial countries. U. S. A., Germany and U. K. are the leaders in the industry. Although these three countries support 12 per cent. of the world's population, they produce approximately 75 per cent. of the world's total output of coal.

U. S. A. is the leading coal-producing country in the world and supplies more than 30 per cent. of the world's total. There are three important coal-fields in the U. S. A.: (i) the Appalachian coal-fields, (ii) the Rocky fields and (iii) the interior coal-fields. The Appalachian coal-fields, beginning from Pennsylvania to Alabama, contain the finest bituminous coal in the world. Pennsylvania alone contributes nearly half of the total supply of the U. S. A. The interior field includes Iowa, Kansas, Illinois, Indiana, Missouri, Dakota and Nebraska. The Rocky fields have not yet been fully explored because population is sparse there.

Great Britain occupies the third position in coal production. The coal-fields of Great Britain have three great advantages:—

(*a*) Coal and iron are found together.
(*b*) Coal-fields are within easy reach of the sea.
(*c*) Limestone, useful for smelting, is often found with them.

In Great Britain there are four important coal-fields: (i) Scotland area, (ii) Pennine Range area, (iii) Midland area, (iv) Wales area. In Scotland rich deposits of coal are found in the Clyde basin, in Ayrshire and along the bank of the Firth of Forth. These areas have exceptional transportation facilities by sea, canal and rail. The Clyde basin is the most important ship-building centre of the world. On either side of the Pennine Range there are large deposits of coal. Lancashire and Yorkshire are the two important centres in this area. Cotton textile industry has developed in Lancashire and woollen industry in Yorkshire. In the Midland area the important districts are North Staffordshire, Leicestershire, Warwickshire and South Staffordshire, where many important industries (like motor car, cycle, boot, lace, tobacco, iron and steel and watch) have developed. South Wales coal is worked more for export than for use as power in the local industries.

Till 1914 the United Kingdom was the leading coal-exporting country in the world. "The proximity of British coal districts to the sea, together with the special quality of the coal, had favoured the development of coal exports to European markets ; so that even Germany, with an export trade of her own, found it cheaper to obtain coal from England for the districts served by her Baltic ports than to bring it overland from Silesia and Westphalia." Since 1921 the conditions have been highly unfavourable to the British coal industry. The advance of oil and of hydro-electric power, the increased use of lignite, economies in combustion and the development of new coal resources in her former markets have affected adversely her coal exports. From January 1947 the coal-mining industry of Great

Britain has passed into public ownership and control by Nationalisation Act of 1946. A Board has been set up to have a monopoly of working and getting coal into Great Britain.

In respect of coal production Germany occupies the fourth place. The Ruhr basin, Westphalia, Saxony, Silesia, and Bavaria are the important areas. The Ruhr basin produces about 80 per cent. of Germany's coal. Germany has no anthracite coal ; her coal is either bituminous or lignite.

France is rather deficient in coal. Normally, France raises about 70 million metric tons of coal a year. There are small coalfields scattered about the country, in Lorraine, near St. Etienne, near La Crusot and in the Rhone delta. The total production is enough to supply only two-thirds of France's moderate industrial needs. Consequently France has to import coal from other countries. Before the World War II, France was the largest importer of coal in the world. The French coal is not very useful for coking.

Soviet Russia is the second largest coal producer. The annual output of coal is about 300 millions of metric tons. In 1913 the output was only 29 million tons. Before the Revolution of 1917 the Donetz coal-field alone supplied more than 90 per cent. of the Russian output. To-day the Donetz field is no longer an important producer. The principal coal-fields of Soviet Russia are Kuzbus (West Siberia), Tunguz (Yenesei basin), Irkutsk, Donbas, Pechora (north of European Russia—in the Tundra), Burein (in the Amur basin), Karaganda (Steppe region of Asiatic Russia), Moscow, Ural and Trans-caucasus (near Batum). [illegible]

[illegible]

Africa has large deposits of coal in Natal, the Cape of Good Hope and the Transvaal. The coal of Africa is of poor quality, with the exception of that of Natal.

In 1950 Japan raised 38 million tons of coal. In spite of this large production, Japan's industrial expansion plan is hampered by coal shortages. The two most important coal-fields of Japan are located in Hokkaido and in Kyushu, the former supplying 40 p.c. and the latter 50 p.c. of the country's total coal. More than 90 p.c. of her coal is of mediocre quality —low bituminous or sub-bituminous. Her coal is not generally suitable for the production of high quality metallurgical coke.

China is very rich in coal but its development is slow because the great bulk of China's coal lies in the midst of mountains in the north-western and south-western parts of the country, far from the water transportation. These areas are also scantily populated and do not contain much metallic ores. Chinese coal is chiefly of anthracite type, and is found practically in every province. The provinces of Shansi, Shensi, Kansu and Honan contain the greatest deposits of coal. The Loess Highlands have about 90 per cent of China's reserves of coal. The annual production of coal in China is now about 30 million tons. In near future China may become one of the leading coal producers of the world.

India occupies the eighth place in the list of the coal-producing countries of the world. The average annual production is above 34 millions of metric tons. But the coal-fields are very unevenly distributed. More than 83 p.c. coal of India comes from the two fields of Raniganj in Bengal and Jharia in Bihar. Other fields are found in M.P., Hyderabad, Central India, Assam and Rajputana. In Pakistan, coal is found in the west Punjab. The annual production of coal in Pakistan is about 388,000 tons against its normal requirement for 3½ million tons of coal.

Petroleum:—It is a general name given to oils, which flow freely or are pumped from holes or bores in the earth. Petroleum is associated with lowlands, generally on the flanks of recently folded mountains. The old block regions such as most of Africa, the Deccan, the Highlands of Brazil and the 'Shields' of Scandinavia and Canada do not contain oil. Petroleum stands second among the minerals in the value of output, surpassed only by coal. Its products are essential to the progress of many industries.

U. S. A., Venezuela, Russia, Persia, Rumania, Indonesia, Mexico, India and Burma are the principal oil-producing countries.

According to a survey by the Petroleum Department of the Chase National Bank, proven and indicated crude oil reserves of the world totalled 86,000 million barrels at the end of 1950. Of this amount, 45·3 per cent. was located in the Middle East and 46·2 per cent was in the Western Hemisphere. The United

States held 27,000 million barrels, or 31·4 per cent. of the world total. The Kingdom of Kuwait on the Persian Gulf had 11,000 million barrels, or 12·8 per cent. ; Saudi Arabia, 10,000 million barrels ; Iran, 9,500 million barrels ; Venezuela, 9,000 million barrels ; Iraq, 7,000 million and Russia, 5,500 million barrels. The rest of the world's reserves of crude oil were in Canada and other Western Hemisphere nations, the Far East and Europe.

CRUDE PETROLEUM : PRODUCTION, 1938 AND 1951
EXCLUDING U.S.S.R.

Country	1938		1951	
	Thousands of metric tons	Per cent of total	Thousands of metric tons	Per cent of total
World Total	250,000	100·0	551,000	100·0
United States ...	171,036	68·4	307,500	55·8
Venezuela	28.127	11·3	89,000	16·1
Saudi Arabia ...	67	—	37,500	6·8
Kuwait	...	—	28,300	5·1
Iran	10,359	4·1	16,400	3·0
Mexico	5,483	2·2	11,000	2·0
Iraq	4,298	1·7	8,400	1·5
Indonesia	7,392	3·0	7,400	1·3
Canada	896	0·4	6,200	1·1
Columbia	2,972	1·2	5,400	1·0
Brunei	707	0·3	5,000	0·9
Egypt	226	0·1	2,300	0·4
Qatar	..	—	2,300	0·4
Peru	2,097	0·8	2,100	0·4
Austria	57	—	2,000	0·4
Bahrein	1,138	0·5	1,500	0·3

World Total including U.S.S.R. was 594 million metric tons in 1951. 6·5%

The chief products of petroleum are gasoline or petrol, fuel oil, kerosene and lubricants. These are used in steamships, rail-roads, manufacturing and commercial heating and domestic heating. Vaseline and medical paraffin oil are also obtained from petroleum. The products of petroleum are so essential to industrial progress that all the major powers of the world are seeking to gain control of oil-fields and are searching diligently for possible reservoirs not yet discovered. During the

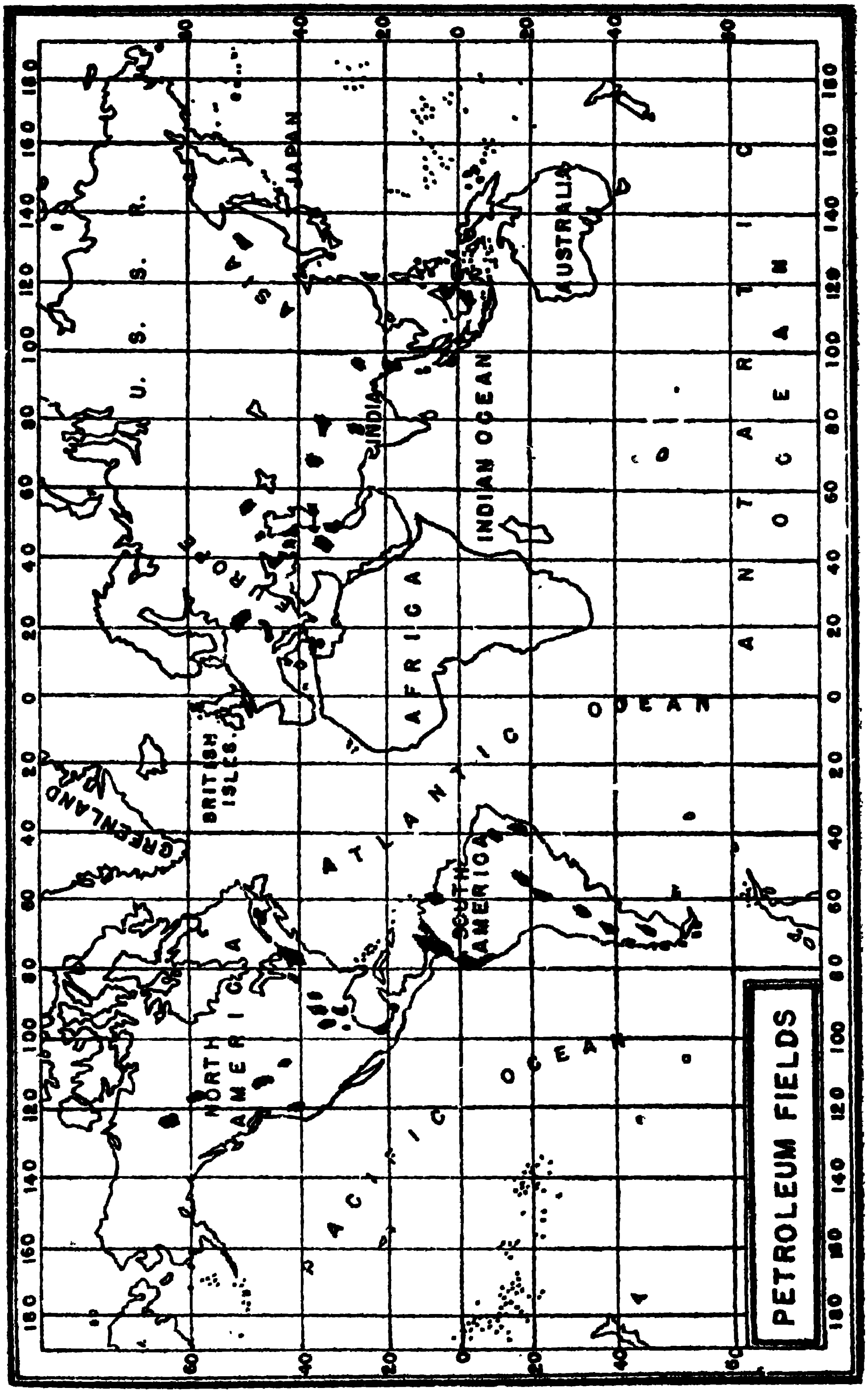


FIG. No. 35. Distribution petroleum fields. Notice the great concentration of oil-fields in the Americas.

last few years the struggle for the possession of petroleum has been so keen that the control of major oil-fields has caused more international concern than that of any other mineral. At present the oil-fields in Burma, Indonesia, Iran, Iraq, Pakistan and India are mostly controlled by the financial interests of the United Kingdom, France and Holland. None of these west European countries have any petroleum supply within its borders.

U. S. A. is the largest petroleum producer of the world. It raises more than 60 per cent. of the world's output. The supply comes from the important states of Oklahama, California, Texas, Kansas, Louisiana, Illinois, Pennsylvania, Ohio, West Virginia and Kentucky. A large portion of the petroleum of the country is exported. Its markets are scattered all over the world. This is only natural in the case of a commodity having such important uses. Despite the enormous increase in output, the demand has gone up in excess of supply with the expansion of aviation, road transport and the conversion of many steamships to burning oil fuel instead of coal.

The largest oil-field is found in East Texas. It has a length of about 40 miles and an average breadth of about 7 miles ; 25,800 wells have been drilled. The oil-fields of California are very deep.

Soviet Russia takes the third place and her two main fields, Baku and Grozny, on opposite side of the Caucasus, are connected by pipe-lines with the Black Sea The oil belt extends along the whole length of the Urals on their western side from Ukhta in the north to Sterlitamak in the south. Ufa in the south-western slopes of the Urals has become so important in recent years that it has come to be known as "Second Baku".

The output of Soviet oil industry in 1941 was a little above 38 million tons. The Soviet Asia contributes about 15 per cent. of the total production. Uzbek, Kazakh and Turkmen in Soviet Asia contain large deposits of oil. In the Far East, the only Soviet oil-field is in the island of Sakhalin where the annual production comes to about 800,000 tons. In 1951 U.S.S.R. raised 42·3 millions of metric tons of crude petroleum.

U. S. S. R. OIL PRODUCTION

(Percentage)

Caucasus-Caspian	90·0	Volga-Urals	4·0
Central Asia	4·9	Far-East	1·1

The second great oil centre is around the gulf of Maracaibo in **Venezuela,** where the oil-fields extend into Columbia. In 1951 Venezuela produced double the quantity of U. S. S. R. Mexico, once the only rival of the U. S. A. in production, has dropped to the seventh place.

In **Rumania,** oil is found at the southern foot-hills of the Carpathians, from *Suceava* in the north to the *Damboritza Valley* in the south. The largest oil-fields are in the Damboritza valley (54 p.c.), Parhova (44 p.c.), Buzau and Bacau. These oil fields were first worked in the eighties of the last century. In 1935 Rumania became the fourth largest producer of oil in the world, coming after U. S. A., U. S. S. R., and Venezuela. The development of Rumanian oil-field was the result of the assistance of foreign capital and the sympathetic attitude of the Government. The importance of this industry to Rumania can hardly be over-estimated. Of the total production, between 70 to 80 p.c. is exported. The foreign exchange position and that of the national finances therefore depend very largely on oil.

With above half the world's proved reserves, the Middle-East raised 95·3 million metric tons of crude petroleum in 1951. Development of its petroleum industry on a large scale is continuing. Several new fields have been discovered as a result of exploration activities. Pipelines and other transportation facilities have been extended. It is estimated that the Middle East has oil reserves of 6,500 million metric tons. The Middle East oil-fields are in Bahrein, Iran, Iraq, Kuwait and Saudi Arabia.

In 1950 Middle East exported 73 million tons of crude and refined oil. The major portion of Europe's demand for oil is supplied by the Middle East. "The sharp rise in the consumption of petroleum products in Europe and the favourable competitive position of Middle East petroleum have greatly increased the demand on this area."

EXPORTS OF PETROLEUM PRODUCTS IN 1950

(In thousands of barrels)

	Crude Petroleum	Motor fuel	Kerosene	Fuel Oil	Total
Iran	49,640	28,989	...	...	181,789
Iraq	46,099	...	...	...	46,099
Kuwait	116,696	...	...	1,543	119,110
Saudi Arabia ...	106,749	7,617	2,900	7,275	113,431

Iran is an important producer of oil. The petroleum industry employs about 70,000 Iranians. Its importance can be judged from the fact that annual royalties paid by the Anglo-Iranian oil company amount to 20 per cent of the Government's actual budget expenditure. The Iran Government initiated the policy of petroleum nationalisation in March, 1951. Implementation of that policy was followed by a stoppage of oil exports in June 1951 and the shut-down of the oil-fields and of the Abadan refinery in August 1951.

The shut-down of the petroleum industry has brought in several problems like stoppage of oil revenue and foreign exchange receipts and unemployment of petroleum workers.

In Iran, the principal oil-fields are in the South West around Kazistan. These fields are at Musjid-I-Suluman, Halt-kel, Gach Saran, Agha Jari, Naft Safid and Lali. Musjid-I-Suluman was the first field to produce oil in 1908, followed by Halt-kel in 1928, Gach Saran in 1941, Agha Jari in 1944, Naft-Safid in 1945 and Lali in 1948. There are pipe-lines from these oil fields to Abadan, a port on the Shatt-el-Arab. Abadan has today the largest oil refinery in the world, its daily capacity being half a million barrels a day.

In Iraq, the oil-fields are situated at Baba Gagur, a few miles north of Kirkuk. The Kirkuk oil-field in Iraq stretching for 70 miles, is one of the greatest single oil-fields in the world. These oil-fields are being exploited by a British Company. A pipe-line has been constructed to join these fields with the Mediterranean sea-board. The pipe-line carries annually four million tons of crude oil to Haifa, 620 miles away, and to

Tripoli, 540 miles away. At Haifa and Tripoli the oil is loaded into sea-going tankers and transported to the world's markets.

"The oil-industry of the peace-loving countries is making an all-out effort, industrially and financially to expand Middle-East production." The development of the oil resources of the Middle-East would reduce the demand for American oil in the European countries. To relieve the pressure of demand for American oil, it will, of course, be necessary to solve the transportation problem in the Middle-East by constructing pipe-lines from the Middle-East fields to the Mediterranean coasts. At present the Middle-East oil is carried by tanker fleet.

There are two oil-bearing areas on either side of the Himalayan arc. The one on the east, and by far the most important, includes Assam and Burma contributing ninety-five per cent of the total output ; the other, on the west, includes the Punjab and Baluchistan in Pakistan. Pakistan raises 15 million gallons of petroleum annually as compared with Indian Union's 82 million gallons. The most prolific oil-fields are found in the Irrawady valley in Burma from which nine-tenths of the indigenous petroleum is obtained.

Japan's annual production of petroleum is less than the daily production in the United States. Japan's petroleum belt lies along the Japan sea-coast from Hokkaido on the north to Northern Honshu. The western part of North Honshu includes the country's two principal oil-fields, *the Akita* and *the Niigata.* From these two fields, 95 p.c. of Japan's domestic oil supply is derived.

The Americans and the British are making investigations to find out new fields. Before the World War II exploration was most active in Egypt, Sinai, Palestine, Syria, Arabia, Iraq, Iran, Afghanistan, Asiatic U. S. S. R., India, Burma, Dutch East Indies, Borneo, Sarawak, Australia and the New Zealand. Exploration is being undertaken in Gold Coast, Nigeria and Equatorial Africa. The British Commonwealth has never been self-supporting with regard to petroleum and is dependent on supplies from outside countries. She controls only 5 p.c. of the world's petroleum output. This figure also includes the production of the Anglo-Persian oil-fields. The U. K. has also extended her financial interest to the oil-fields of Mexico and Venezuela.

Petroleum is very easily and economically transported and the usual method of movement is by tank-steamer or by pipe-line. As a source of power, petroleum competes with coal. Formerly all steamers used coal as fuel ; but to-day nearly 50 p.c. of these vessels use oil. Oil enjoys certain advantages as steamship fuel inasmuch as it conserves space and also because oil-driven ships can be handled with a smaller crew.

World consumption of petroleum has been increasing at the rate of about 10 per cent annually. Although supply of oil from major sources is also rising at varying rates, signs of depletion of reserves of oil are distinct and even disquieting in many places. Great care is being taken to effect economy in the use of oil. In many countries of Europe, alcohol is mixed with petroleum to the extent of 20 p.c. for motor vehicles. The sources of ethyl alcohol are oil-seeds, sugar-cane, potatoes and timber. In the utilisation of vegetable oil contents, the British Empire and Commonwealth enjoy unique advantages. Germany produces synthetic oils by the hydrogenation of coal and tar.

Natural gas :—It is found in association with petroleum. Nearly 98 p.c. of the world's natural gas is raised in the U.S.A. where it is exploited in the Appalachians, Gulf Coast and the central region. Natural gas has tremendous heating power and is very economical.

Water-Power :—Water-power is a major source of mechanical energy which has revealed a new phase of industrial usefulness. Unlike coal, hydro-electricity is inexhaustible. Water-power is a perpetual mine, and every horse power generated hydraulically represents an annual saving of approximately 4 tons of coal. Its introduction has freed many countries from the great drawbacks arising out of the absence of coal. Norway, Switzerland, Finland, Canada and Sweden now-a-days use water-power both for industrial and illuminating purposes. In Sweden hydro-energy accounts for about 92 p.c. of the total output, the rest being generated by thermal plants. In regions where both coal and water-power are available, their comparative importance will depend upon the relative ease and cost of generating electricity. Italy, Spain, France and Germany use both water-power and coal advantageously.

"*Certain geographical conditions are necessary before water-power can be utilised.* They are—

(*i*) abundant precipitation,

(*ii*) fairly uniform discharge of water through streams resulting from (*a*) uniformly distributed precipitation or (*b*) regulation of stream flowing through natural lakes, forested watershed or artificial storage behind dams, and

(*iii*) a slope or gradient which permits the water of a stream to be used and re-used for power development."

If a river with these ideal conditions is located near an area of dense population, the transmission of power becomes comparatively cheap. Generally the power is not transmitted beyond 300 miles from any station.

At present the development of water-power is almost confined to regions of high economic standing, of which two great areas stand out prominently. These are (*i*) Eastern U.S.A. with the adjacent parts of Canada, and (*ii*) Western and Central Europe. More than 60 per cent. of the world's output of hydro-electric power is produced in these areas.

The total output of all the hydro-electric stations in the world reached 86·9 million H.P. at the end of 1947.

HYDRO-ELECTRIC DEVELOPMENT (UP TO 1950)

Country	Hydro-electric installed capacity (in million k.w.)	Per capita consumption units kwh.
Canada	7·7	3,580
Norway	4·5	3,579
U.S.S.R.	22·4	2,150
U.S.A.	14·9	1,775
Sweden	2·6	1,743
Switzerland	2·6	1,717
U.K.	0·5	885
France	3·7	612
India	0·5	12

Other countries in decreasing order of importance are Germany, Austria, Spain and U.S.S.R. There are, however, immense scope and possibilities of water-power in the various countries, now using hydel power.

The present ratio between water-power developed and water-power potential is as follows:—

	p.c.		p.c.
Switzerland	67	U. S. S. R.	34
Germany	54	Sweden	27
Norway	53	U. S. A.	24
France	42		
Canada	34	India	1

In the U.S.A., the Niagara Falls provide energy for a large number of hydro-electric installations. California, New England States and the Rocky Mountain States are all well supplied with water-power. A remarkable development in water-power has also taken place in Canada, where "practically every large industrial centre is now served with it". The success of the pulp paper industry of Canada almost depends on it. The water-power resources are well distributed throughout the country. But during winter, when the rivers and streams of the north are ice-bound, utilisation is greatly hindered.

France offers unique opportunities for great development of hydro-electricity along the Alps, the Pyrenees and the Cevennes. The manufacturing industries and transport of the southern side can be best served by water-power. France is rich in iron-ore but deficient in coal. So it is possible that further development in water-power will take place in France in the near future for the utilisation of her iron-ore. Italy and Switzerland have developed water-power to a great extent. In spite of the absence of coal and oil, Switzerland is essentially a manufacturing country where water-power is utilised not only in factories but also in railways. In Norway and Sweden the streams are of major importance as sources of water-power. The abundant precipitation, snow-fields, glaciers and lakes in the highlands of Scandinavia and the number of falls and rapids makes these rivers the most important sources of water-power in Europe. Germany has certain important installations in the south and south-west, but her resources of water-power are limited.

Japan is rich in water-power. The rugged surface of the islands, the swift flowing streams and the heavy, well distributed, uniform rainfall provide ideal conditions for developing hydro-electricity. Most of the large power sites are located on the eastern and southen slopes of the mountains of Central Honshiu. The first hydro-electric plant in Japan was established in 1892 in Kyoto on a stream flowing from Lake Biwa. Next to the U.S.A. and Canada, Japan was in 1939 the world's largest producer of hydro-electric power. Of the power produced, about 55 p.c. is consumed by industry.

There are fair prospects for the development of water-power in India. At present India is exploiting only 1 p.c. of her water-power potential. The great difficulty lies in the fact that in India rainfall is seasonal and, therefore, costly storage works are indispensable. The Western Ghats of the Bombay Presidency, Kashmir, East Punjab and Mysore have developed water-power to a certain extent.

Manganese-Ore :—It is used for the hardening of iron and steel, in the manufacture of block enamel, in the chemical industry for the manufacture of bleaching powder and in electrical and glass industries. About 95 p.c. of manganese is consumed in the metallurgical, and 5 p.c. in the chemical industry.

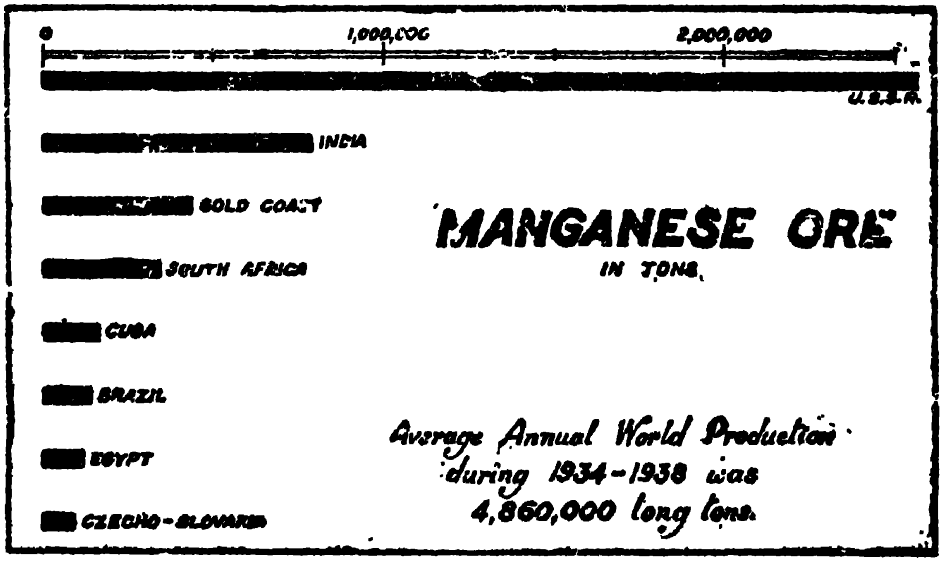


FIG. No. 36.

Russia, India, South Africa, Cuba, Brazil, Gold Coast, Egypt and Czechoslovakia are the chief producers of manganese.

Small deposits of manganese also occur in China, Hungary, Germany, Rumania, Spain and Malaya.

It is estimated that for every ton of steel produced, 13 to 15 lbs. of manganese are required. As it happens, the world's important sources of high-grade manganese ore, with the exception of Russia, are not located in those countries which are the chief steel producers. Seventy per cent of world's steel comes from U. S. A., U. K., Germany, France, and Japan, and these countries produce only one per cent manganese.

U.S.S.R. is the largest producer of manganese in the world. The two important manganese-producing areas in U.S.S.R. are the Georgian Republic and the Ukraine. In Georgia the deposits are located at Tchiaturi in the province of Kutais. The Ukraine supplies manganese from Nikopol to the north of the Black Sea. In the Soviet Union, over 90 per cent of the manganese ore production is from the Nikopol and Tchiaturi districts. A very considerable tonnage of her ore is used for the domestic iron and steel industry. In 1947, the U.S.S.R. production was estimated at 2·8 million tons followed by Gold Coast with half a million ton and India with 400,000 tons. India, which ranked first till 1929 in the production of this ore, has deposits in Madras, M.P., Bihar, Orissa, Bombay and Mysore. Most of the Indian ores are hard lump ores very suitable for metallurgical purposes. The second producer is Gold Coast, where further progress in the output of manganese will take place with the improvement of transport and labour conditions. Gold Coast raised 376,000 metric tons of manganese in 1950. Brazil has many manganese deposits, but the major production comes from the Lafayette district in Minas Geraes. The Brazilian ores are on the whole of lower grade than Indian ores. In 1947, Brazil raised 110,000 tons of manganese.

South African deposits are near Postmasburg in Griqualand West, a part of Cape Province and are under the disadvantage of being far-off from the sea board. The production of South African manganese in 1950 was 316,000 metric tons.

Unlike most metals, a very large proportion of manganese required in metallurgy is entirely lost once it is used ; only a negligible amount can be recovered as a secondary metal.

Sulphur :—Sulphur is widely used in agriculture and industry, mainly in the form of sulphuric acid—which consumes about three-quarters of the supply—and in other sulphur compounds, such as sulphur dioxide and carbon bisulphide. Sulphuric acid is the basis for agricultural fertilizers, such as superphosphate and ammonium sulphate, and is also required in the production of textiles and dyestuffs and in the metallurgical industries. Sulphur dioxide is used mainly in the wood-pulp industry, and carbon bisulphide in the production of viscose. Sulphur is also used in the production of insecticides and in the manufacture of rubber products and explosives.

Sulphur is not widely distributed. It is generally found in volcanic regions in combination with other mineral products, specially with iron, lead, zinc and antimony.

Production of sulphur is mainly confined to U. S. A., Italy, Spain and U. K.

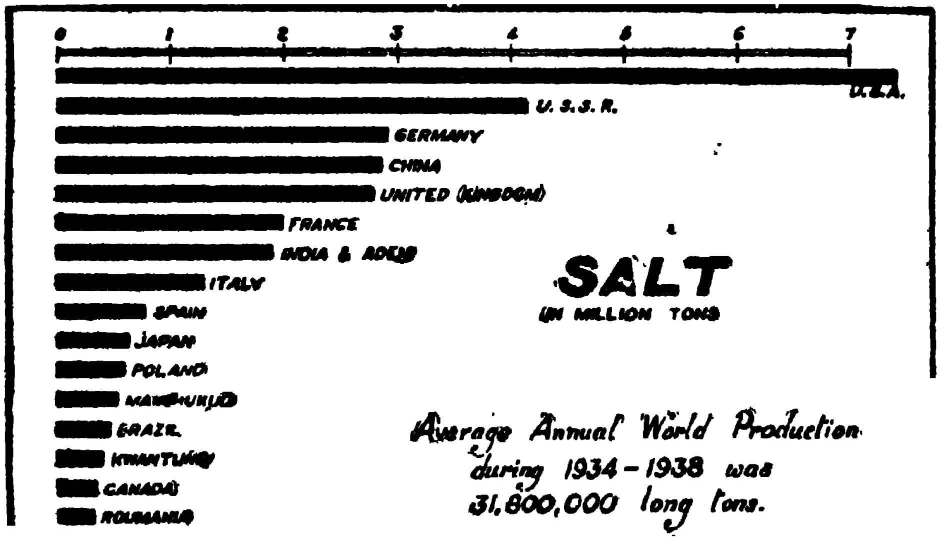
CHIEF SULPHUR-PRODUCING COUNTRIES IN 1947

(In 1000 tons)

U. S. A.	4,440	Japan	21
Spain	43	U. K.	111
Italy	164	Chile	30

U. S. A. is the largest producer and exporter. It dominates the world market.

Salt :—Common salt is one of the necessaries of life. It is found in the crust of the earth in a solid form known as rock



Average Annual World Production during 1934-1938 was 31,800,000 long tons.

FIG. NO. 37.

salt. The sea is also one of the chief sources of this material, for it is obtained by evaporating sea-water. In addition to the universal use of salt in food, great quantities are used in packing and preserving fish, meat, hides and butter. Salt is used in the manufacture of soda, glass, bleaching powder etc.

The production of salt is widely distributed. The principal countries are the U. S. A., British Isles, Germany, India, France, Japan, Austria, Italy and Spain.

About 60 per cent. of the Indian salt is obtained by evaporating sea-water on the coasts of Bombay and Madras. Another source of salt is the Salt Range and the Kohat mines in Pakistan. The other two sources are salt brine from the Sambhar Lake in Rajputana and salt brine condensed on the border of the Rann of Cutch.

Graphite :—It is widely used in the manufacture of crucibles, lubricants and lead pencils. U. S. S. R. is the leading producer, where more than one-third of the world's total is found. The next important producer is Korea, though her production is much smaller than that of the former.

PRODUCTION OF GRAPHITE

(In tons)

U. S. A.	3,917	South Africa	2,141
Korea	10,000	Madagascar	3,853
Norway	2,442	Ceylon	9,005
Austria	4,370	Italy . ..	4,085

The world production was estimated at 200,000 tons in 1947.

Asbestos :—It is a fibrous rock. Its fibres can withstand weather, water and fire. It is a non-conductor of both heat and electricity. This non-metallic mineral is used for making fire-proof safes and vaults. The fibre can be woven into curtain for roofs and floors.

The principal producers are Canada, U. S. A., Italy and South Africa. It is also found in India in the provinces of Bihar, Orissa, M. P. and Mysore.

The world production of asbestos in 1948 was 743,000 tons of which 590,000 tons came from Canada.

In 1950 Africa raised 174,000 tons of asbestos of which three-fourths came from Union of South Africa and South Rhodesia.

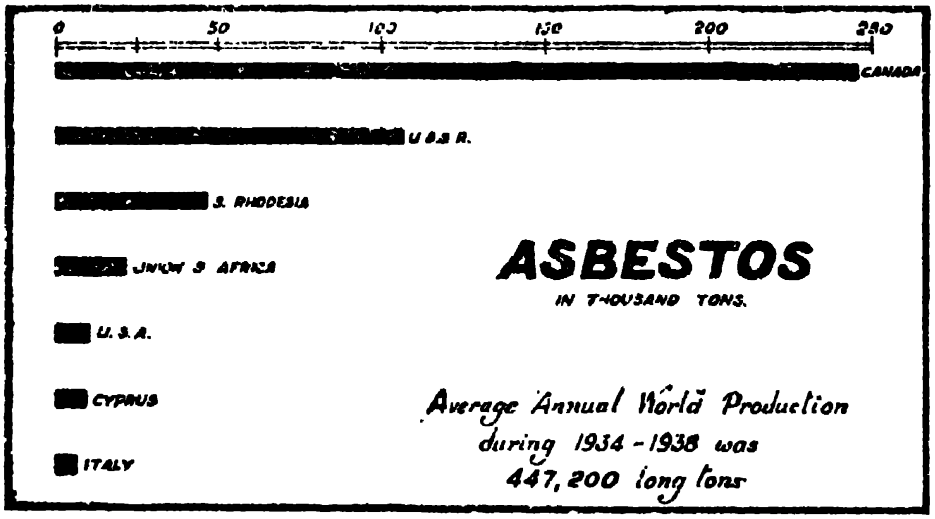


FIG. No. 38. Yield of asbestos in the chief producing countries before the World War II.

Mica :—This mineral is chiefly used in electrical industries. Mica assumed a position of great importance during the last War in connection with the development of wireless telegraphy, aeronautical science and motor transport.

The chief producers are India, U. S. A., and South Africa.

India has for many years been the leading producer of sheet mica with an output of more than three-fifths of the world's total supply. Mica is found in Bihar, in the Nellore, Salem and Malabar districts of Madras, Travancore, Ajmer-Merwara and other parts of Rajputana.

In South Africa, the bulk of the output is from the Lomagundi district of Southern Rhodesia. Rich deposits also exist in the Transvaal, Cape Province and Natal. India and South Africa are the only exporters. Although the U. S. A. is the second largest producer of sheet mica, it is a rather poor second, with India at 75 p.c. of the total and the U. S. A. having only 10 p.c. In the U. S. A. mica is found in North Carolina and New Hampshire. In the production of mica of all grades, the U. S. A. is the largest supplier with 50 p.c. of the world's total. In the production of sheet mica, India dominates the world market. It is also found in small quantities in

Australia, France, Germany, Norway, Spain, Portugal, Russia, Japan, Canada and Argentina.

In 1947, the U. S. A. raised 48,000 tons of scrap mica and 480 tons of sheet mica compared to India's 6,500 tons of sheet mica.

Precious Stones :—Search for precious stones is responsible to a large extent for stimulating human activity in trade and commerce. Diamond, ruby, sapphire, emerald and garnets are the chief precious stones scattered all over the globe. Most of the world's supply of diamond comes from Kimberly mines of South Africa. Diamonds are also found in Brazil, India, New South Wales and British Guiana.

CHIEF DIAMOND-PRODUCING AREAS IN AFRICA

(In millions of carat)

	1937	1950		1937	1950
Belgian Congo ..	4,925	9,650	Angola	626	555
Gold Coast ..	1,578	932			
U. South Africa	1,030	1,732	Sierra Leone ..	913	655

Ruby and sapphires are obtained chiefly from Ceylon, Burma and Siam. Emeralds are worked in Columbia, Siberia and New South Wales. Garnets occur in Saxony, Bohemia, Burma, Ceylon and the Urals. A little quantity of garnets is also raised on a commercial scale in Kodarma in Bihar (Indian Union).

Building Stones :—The most widely used of all building materials are limestone, traprock, marble, sandstone and slate. The heavy weight and cheap price do not generally permit the working of the building materials far from their markets. *Clay* is used for making bricks, tiles and pottery. *Granite* is found chiefly in England, Sweden, France and Canada. Italy supplies the finest *marble* of the world. Marble is also quarried in England and the U. S. A. *Slate* mined has a long life, being hard, dense and insoluble in acid. It is chiefly used for roofing, black boards and bulletin boards. Other uses are for table tops, school slates, refrigerator shelves, etc. *Cement* is generally prepared by mixing clay with limestones. When cement is mixed with sand, gravel or crushed stone, the product is "concrete". Cement is extensively used in building roads, houses, streets and also in the construction of bridges, harbours and sea-walls. There are few countries which do not possess limestone and clay for the manufacture of cement.

QUESTIONS

1. What are the most important uses of (*a*) Petroleum and (*b*) Platinum? Where are they found? —(Cal. Inter. 1927).

2. Compare coal and petroleum as sources of power and give their world distribution. —(I. I. B. 1944).

3. Name any four countries where water-power is principally used. Explain the special circumstances in each country favouring its use in preference to other forms of power. —(Cal. Inter. 1933).

4. Describe the eight principal British Coal-fields and their connection with the British manufactures. —(Cal. B. Com. 1923, 29, 31).

5. Name the countries from which the following minerals are exported—Coal, iron and petroleum. —(Cal. B. Com. 1924).

6. Discuss the present distribution of steel industry in the Continent of Europe. —(Cal. B. Com. 1927).

7. What are the principal steel-exporting countries of the World? What are the principal consuming markets of steel? —(Cal. B. Com. 1934).

8. Give a brief account of the world distribution of coal, its various uses and by-products. —(Cal. B. Com. 1949).

9. "In modern age coal and iron are more valuable than gold and diamond." Support or criticise the statement.

10. In what conditions may a coal mine be of greater value than a gold mine? Illustrate your answer with reference to the coal mines of (*a*) Great Britain, (*b*) Germany. —(Cal. Inter. 1927).

11. Briefly describe the world distribution of coal and iron with special reference to their economic importance. —(I. P. S. 1932).

12. Discuss the distribution of non-ferrous metals in the British Empire with special reference to the sources of supply within India. —(Cal. B. Com. 1934).

13. "The discovery of minerals and precious metals has often given great impetus to the development of a country." Discuss this statement with special reference to North America and South Africa. —(I. P. 1930).

14. Give an account of the World distribution and present production of mineral oil. —(Cal. Inter. 1940).

15. Write short notes on the use of any four of the following minerals and also state the sources of their supply: (*a*) Platinum, (*b*) Mica, (*c*) Zinc, (*d*) Copper, (*e*) Manganese and (*f*) Graphite. —(Cal. Inter. 1938).

16. Name the most important producers of pig iron having surplus for export. —(B. Com. 1938).

17. What are the liquid fuel producing countries?—(B. Com. 1940).

18. Where are the principal oil-fields of the world located? Explain the petroleum policy of any two of the following countries: Great Britain, France, Germany, U.S.S.R. and Italy. —(Cal. M. Com. 1941).

19. Discuss the importance of mineral oil in modern warfare and industrial development and examine the resources in this respect of the leading world powers. —(The Indian Institute of Bankers, 1935).

20. What are the chief sources of industrial power? Examine the sources of the different parts of the British Empire with regard to each one of these. —(I. I. B. 1945).

21. Give a geographical account of the principal oil-fields of the Near East bringing out the political and strategic significance of their situation. —(Cal. B.A. 1942).

22. Name the important sources of supply of non-ferrous metals outside Europe. How and where are the supplies being consumed to-day? —(Cal. B. Com. 1943).

23. Briefly describe the distribution of mineral oil outside the United States of America. —(Cal. Inter. 1944).

24. Describe the conditions favourable for the large-scale production of hydro-electricity. How far has hydro-electricity influenced the localisation of industry? —(Delhi U. Prep. 1950).

25. Give an account of the world distribution of petroleum and discuss in this connection the position of the oil-fields of the Middle East.

CHAPTER V

FISHING

Fishing is an important commercial industry. The sources of fish are—(*a*) Fresh water and (*b*) Sea water. Fresh-water fish is found in rivers, lakes, ponds, etc. and it is important only for local consumption. Sea-water fish is important both for local areas and also for wider demand outside.

At present in many countries fishing is carried on with the help of drifters and trawlers. These vessels can go very far and are less dependent on weather ; so they can handle bigger catches. The average annual catch of sea-fish is 13·5 million tons, of which Japan contributes 37 p.c. The production is about 18 p.c. in the British Empire.

Fish lives either in the sea bottom or at various depths not far below the surface. The methods of sea-fishing are trawling and drifting. In shore, fishing is practised by trawling and deep-sea fishing by drifting.

The modern trawl net is dragged along the bottom of the sea at a rate of two to six miles an hour, and finally drawn up into the trawler. Drifting is used for fish living at various depths not far below the surface. A steam drifter carries a crew of ten and about 90 nets. These nets are joined together by short ropes at the top and bottom.

The important fishing areas are found within a few hundred miles of the coast. They lie partly on the shore-belt of shallow water which covers the continental shelf or the submerged platform surrounding the continents. Others are located in the elevated parts of the sea floor at some distance from the shore, as the Dogger Bank in the North Sea. The shallowness of the water permits an abundant growth of small organisms which serve as food for many small animals of the sea. These small animals in turn are eaten up by fish. Again, the refuse materials deposited by rivers in the shallow water near the coast are excellent food for fish. Moreover, shallow water is the best spawning ground for fish.

Another particular feature of fishing is that *all the important grounds are confined to the temperate zone.* This is because the warmth of the tropical water appears to favour the growth of innumerable kinds of fish, including poisonous and inedible

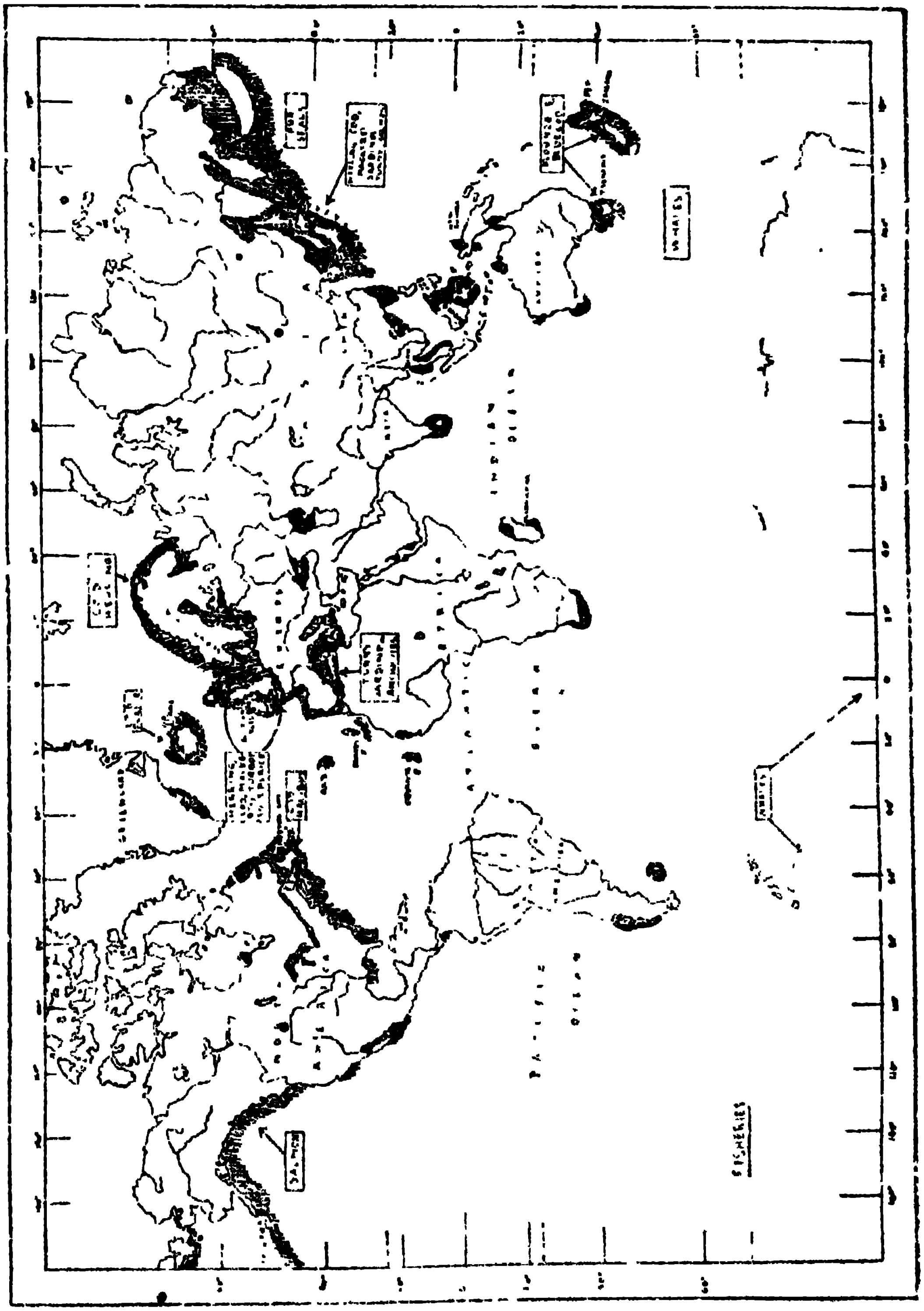


FIG. No. 39. Distribution of the principal fishing grounds. The North Sea is the greatest fishing ground in the world.

varieties. But the physical conditions of the cooler waters of the temperate seas favour the individual abundance of fewer species of fishes, many of which are valuable for human consumption.

It must be noted that trade in fish is easier in the temperate zone, for it is less difficult to preserve fish in cold weather.

There are four principal fishing grounds in the world: (*i*) The North Atlantic coast of Newfoundland, Maritime Canada and New England. (*ii*) The coast of North-West Europe. (*iii*) The coast of Japan. (*iv*) The North Pacific coast of the North America.

The fisheries of the north-eastern sides of North America are based on a rich combination of rivers, bays and shallow off-shore banks. From New England to Newfoundland, along the coast, herring and halibut are extensively found. Newfoundland and Labrador offer one of the best modern examples of people living from one resource—so great is the dependence upon fish. Two-thirds of the exports are fish products. Fishing is equally important for Nova Scotia. In the North Atlantic coast of North America the chief fishing centres are Boston, Halifax, St. John, Montreal and Portland (Maine).

The deep sea-fisheries are confined to the Grand Banks and the south of Newfoundland.

The North Sea is the largest fishing ground in the world. It is very shallow and abounds with fishing banks. It is surrounded by populous countries like Great Britain, Norway, Holland, Germany, France, Denmark and Belgium. Each of these countries takes an active part in the fishing industry.

Great Britain ranks second in fishing industry in the world, being surpassed only by Japan. It is the sixth biggest industry in the U. K., where more than 40,000 people are engaged in it. It is the leading country both for the import and export of fish. South-east England and the coastal towns of northern Scotland are the fishing centres. Wick, Thurso, Fraserburg, Peterhead and Aberdeen are the important fishing centres of Northern Scotland. In south-east England, the important fishing centre are Yarmouth and Lowestoft. Here large quantities of herring are packed in salt and dried for export to the Continent. Fifty per cent. of the total catch of Britain is herring. Cod, mackerel, oyster and haddock are also caught. In the west coast of Britain, the lake fisheries are the most important. Fleetwood and Milford are the leading ports. The greatest fish market is Billingsgate in the city of London. Although large quantities of fish are caught in the U.K., the country imports annually a considerable quantity. In 1949 the U.K. caught a little more than 1 million tons of fish and imported 183,000 tons of fish.

Norway furnishes one of the finest examples of the close relations between geographical conditions and the fishing industry. Numerous harbours, invigorating climate and paucity of agricultural land have compelled the Norwegians to look to the sea as an instrument of their prosperity and progress. The important fishing grounds are confined to the south of the Lofoten islands where large numbers of cod and herring are caught. Cods are caught in Hammerfest and Tromso. Trondheim and Bergen are the centres of herring fisheries. Norway supplies over 50 per cent of the whale oil of the world. Fish accounts for one-third of the total value of export of Norway.

The continental shelf around Japan is one of the major fishing grounds of the world. The fisheries are important in the cool seas around the north of Honshiu, Hokkaido and Karafuto. Many varieties of fish are found because of the cold and warm currents washing the west and the east coasts respectively. The Japanese fishermen go as far as the Kurile Islands and Kamchatka peninsula in the north eastern Pacific where their presence has been a source of friction between Japan and U.S.A. and between Japan and Canada.

Japan consumes fish more than any other country in the world, and the average annual value of Japan's fisheries is greater than that of any other country. Exports of fish to foreign countries are not proportionatey large, for the major portion of the catches is consumed in the country. Even then in 1939 fish were Japan's seventh largest export. Her fishing industry employs about 1½ million people. The per capita catches in the country are, however, small. Nearly 80 per cent of the total catch of fish in Japan is obtained from the coastline of Hokkaido, Korea, Kurile Islands and Sakhalin. Cod, herring, mackerel, salmon and crab are caught in the west coast, while in the east coast the chief catches are bonits, tunny and turtle. Cultured pearls are produced now-a-days in Japan by breeding oysters and inserting in them grains of sand around which pearls are formed. Such pearls are suitable for cheap jewellery.

The fishing area on the North Pacific Coast of North America extends from the Gulf of Alaska to the North Californian Coast. Though the region is sparsely populated, the fishing industry has developed greatly.

Salmon fisheries are of the greatest value to Alaska which annually produces more than three-fifths of the enormous salmon catch of the Pacific America.

The fiords and skerry coast of British Columbia make it an ideal fishing ground. The Fraser River, Skeena River and the waters about Queen Charlotte island abound with salmon fish.

Herring, cod and halibut are also caught for export. Sardines are caught off the Californian Coast. The important fishing centres are Victoria, Sitka, Vancouver, Prince Rupert Island, and Portland.

Fish is caught in many other regions. Along the north and eastern coasts of Australia, the coasts of East Indies and the Mediterranean coasts, fish is caught and consumed. River fish is important for local consumption. The rivers of Russia, Central Europe, North America, India and China provide large quantities of fish.

Whale and seal are non-edible fish. Their chief commercial value lies in the oil obtained from their fat. Whale is generally found in the Arctic waters between Norway and Newfoundland. It is also caught in the Ross Sea in the Southern Hemisphere. Seal oil is used for soap-making. The skins are tanned and used for various kinds of leather goods. As the seals are found in the Arctic waters, the hunting is really very dangerous. Newfoundland, Norway and Russia are the leading countries in respect of seal-hunting.

Mention may be made of pearl fisheries which are in Ceylon, the Persian Gulf, Sulu Archipelago, off new Guiana, off some parts of the Australian coast and amongst some of the Polynesian islands. The value of a pearl depends upon its size, shape, colour, brightness and freedom from defects. The most valuable pearls are those which are perfectly round ; the button-shaped ranks next, and then comes the pear-shaped pearls.

QUESTIONS

1. Examine the physical conditions that are the characteristics of the great fishing grounds. Illustrate your answer by examples.
—(Cal. Inter. 1933, B. Com. 1933).

2. What are the chief fishing grounds of the world?
—(Cal. Inter. 1944).

3. Write a short essay on the fishing industry of Japan.

4. "All fishing grounds are confined to the temperate zone." Explain.

5. Describe the economic importance of shallow seas with regard to fishing. —(Cal. Inter. 1939, 41).

6. Give an account of the principal fisheries of the world. Which of these are of special importance to Great Britain?
—(I. I. B. 1931, G. C. I. Cal. 1950).

CHAPTER VI

PASTORAL AND ANIMAL INDUSTRIES

Animals are domesticated for food, transport, clothing and also for raw materials other than those for clothing. The important domestic animals are cattle, sheep, pig, horse, ass, camel, goat and elephant. Since animals require a large area in which to roam and feed, the great stock-raising areas of the world are found in those countries where extensive grasslands exist. In densely populated countries or in mountainous areas, it is difficult to develop such occupations. There is little room, therefore, in Belgium, Italy and Japan for pastoral industry.

Animals supply food in the shape of meat and dairy produce. Meat is not an essential food. A large portion of the world's population does not take meat. Meat animals are cattle, sheep, goats and pigs. Formerly meat animals were raised near the markets, but to-day, thanks to the introduction of refrigeration and improved means of communication, markets which are thousands of miles away from the pasture lands can be supplied with fresh meat. Meat can also be preserved in air-tight vessels. U.S.A., South America and Australia have developed to a great extent the meat-canning industry. Argentina holds the leading position in the meat trade of the world. The conditions favourable to Argentina are its vast grassy level plain and the nearness of the cattle-lands to the sea-board.

Net Exports of Meat (Thousand Metric Tons)

1947

Argentina	694	Uruguay	126
U. S. A.	270	Denmark	134
New Zealand	366	Brazil	78
Canada	191	Paraguay	26
Australia	234		

Beef cattle are reared in the rich grasses of Brazil, Argentina, Uruguay and Paraguay, from where chilled meat and tinned meat are exported. The great American Plains from Texas to Alberta raise beef cattle in large numbers.

Sheep are found practically in all the continents and are bred for wool and mutton. Mutton sheep are best raised in England. Large quantities of mutton come from Australia, New Zealand, South Africa and Uruguay.

Pigs are found in every part of the habitable globe as they are easily adapted to a new environment. They are easily domesticated, and are reared in large numbers in the U.S.A., the countries of Western Europe, Argentina and Brazil. U.S.A. is a large producer of pigs. The Maize districts of Iowa, Illinois, Indiana, Ohio, Kansas and Nebraska raise more than one-half of the U.S.A.'s total supply. Chicago, Kansas city, Omaha and Milwankee are the main centres for *pork packing and bacon curing.* Lard (fat from pigs) is also exported from the U.S.A.

Germany, Holland, Denmark, Spain and Portugal are other important pig-raising areas.

LEADING PIG-PRODUCING COUNTRIES (1946-48)

(000 omitted)

Countries		p.c. of world total	Countries		p c. of world total
China ..	56,000	23·4	U. S. S. R.	9,000	3·9
U. S. A. ..	58,000	23·8	France ..	5,000	2·0
Germany ..	8,000	3·4	Mexico ..	5,000	2·0
Brazil ..	23,000	9·7	Canada ..	5,400	2·3

Since pig is a prolific breeder, it is very much important as a source of meat supply in countries of dense population. Generally speaking, the presence of a large number of pigs in a country shows that "the pressure of population is taxing the resources of the land so that it must be used more economically".

WORLD CATTLE IN NUMBERS (IN MILLIONS)*

Countries	Average (1936-40)	1947	Countries	Average (1936-40)	1947
India ..		136·7	Germany ..	16·1	14·0
U. S. A.	66·7	81·2	France ..	15·5	15·1
Brazil ..	40·8	46·0	Australia ..	13·3	13·4
U. S. S. R.	59·8	46·8	South Africa ..	11·6	12·1
Argentina	33·8	41·3	Mexico ..	11·7	12·4
Uruguay	64·3	70·0	World total ..	733·4	747·7
China	24·0	22·8			

* Source : *Records and Statistics*—Supplement to the Economist.

Dairying is an industry which depends entirely on climate. Dairying has developed in lands of moderate coolness where rainfall is sufficient for the heavy growth of grass and other forage required by cows. The winter in such lands is mild and therefore indoor stabling and feeding of cattle is not necessary. U.S.A. and North-Western Europe are the two important areas devoted to dairying. Milk, butter and cheese are the main produce.' In the U.S.A. the leading areas are Wisconsin and Illinois. More than 20 millions of cows are reared in the dairy farms of the U.S.A.

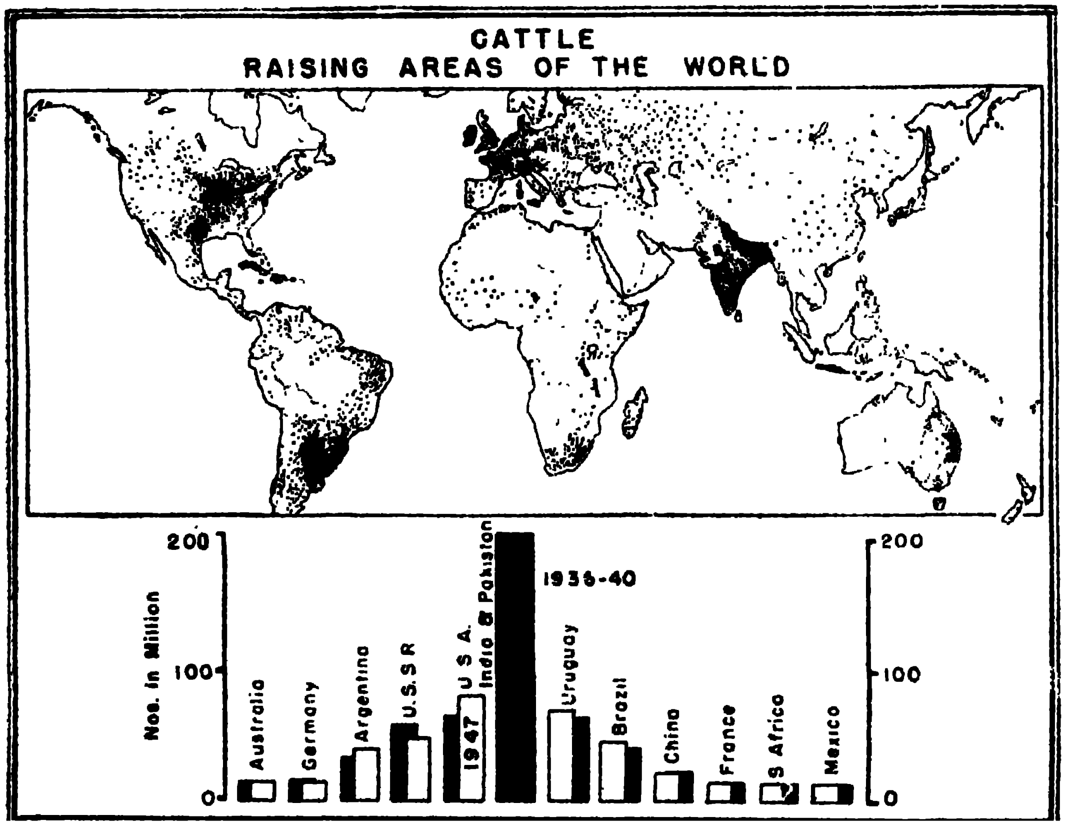


FIG. No. 40. Note that the vast areas of grasslands in Africa are useless for cattle, while Europe, India and Australia, though geographically unsuitable for cattle, have been made suitable by man's ingenuity and labour.

In Europe, the low countries of the north-western section have rich pastures. Denmark is the pre-eminent dairy-farming country in the world. Denmark's success in dairying is due to co-operative societies. At present there are nearly 9000 societies in the country. Eighty per cent milk is used for making butter, ten per cent for cheese and condensed milk and the rest is consumed locally. The dairy produce amounts to 76 per cent of the value of Danish exports. Holland is also famous for dairy produce. The other countries are Switzerland, France, Sweden, Ireland, Germany and Finland.

New Zealand is one of the leading dairy countries in the British Empire. The Government always takes active interest in farming. The butter and cheese of New Zealand have wide markets.

Estimated Total Production of Milk and Estimated Production and Consumption per head for Twenty Countries*

Country	Total production of milk (million gallons)	Human population (thousands)	Daily production per head of population	Daily consumption per head of population
New Zealand ..	870	1,559	244	56
Denmark ..	1,200	3,551	148	40
Finland ..	620	3,666	74	63
Sweden ..	980	6,233	69	61
Australia ..	1,049	6,630	69	45
Canada ..	1,580	10,377	66	35
Switzerland ..	607	4,066	65	49
Netherlands ..	970	7,935	54	35
Norway ..	290	2,814	45	43
U.S.A. ..	10,380	1,22,775	37	35
Czechoslovakia ..	1,200	14,730	36	36
Belgium ..	651	8,092	35	35
Austria ..	545	6,760	35	30
Germany ..	5,096	66,030	34	35
France ..	3,150	41,835	33	30
Poland ..	1,990	31,948	27	22
Great Britain ..	1,474	45,266	14	39
Italy ..	1,050	41,177	11	10
Rumania ..	382	19,033	9	9
India ..	6,400	3,52,838	8	7

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* *Report on the Development of the Cattle and Dairy Industries of India.*—Norman C. Wright.

Although India leads in cattle production, her dairying and meat industry are insignificant. The average consumption of milk per head per day either in the liquid form or as milk products does not exceed 7 ounces in India while in the foreign countries like New Zealand and Australia it is 56 and 45 ounces respectively. Denmark, Ireland and France are specially noted for butter. The leading producers and exporters of cheese are Canada, Italy and Holland.

In recent years a considerable development has taken place in poultry-keeping in the U.S.A., Denmark and Russia. Fowls, turkeys, ducks and geese are domesticated and used for meat and eggs.

Poultry Production

(In millions)

	1939	1947		1939	1947
U. S. A.	410	475	Poland	50	—
China	345	—	Argentina	43	—
U. S. S. R.	208	—	Denmark	29	19
Germany	90	—	Ireland	16	18
U. K.	72	62	Holland	33	10
France	69	—	Belgium	34	6
Canada	55	86			

Wool is an important animal product and holds a high place amongst textile materials. Camel, sheep and goat supply nearly 90 per cent of the world's total wool.

So far as material for clothing is concerned, no animal can compete with sheep. New Zealand, Australia, South Africa, Uruguay, India and the U.S.S.R. are the large producers of sheep.

World Sheep Numbers (in millions)*

Countries	Average (1936-40)	1947	Countries	Average (1936-40)	1947
Australia	112·5	95·7	New Zealand	31·3	32·6
U. S. S. R.	66·0	60·0	China	26·0	22·0
U. S. A.	51·4	37·8	U. K.	26·1	16·7
Argentina	44·9	54·0	Uruguay	17·9	20·5
South Africa	39·8	30·7	World total	740·6	697·1
Indian Republic	43·2	50·2			

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* Source : *Records and Statistics*—Supplement to the Economist.

Sheep yielding best wool require a dry, warm, temperate climate and limestone soil. The best wool-producing sheep is 'Merino'. The great wool-producing areas are found in the thinly populated grass-lands. Australia is the biggest wool producer and supplies more than one-fourth of the world's total wool production. The main sheep-belt lies on the leeward side of the Eastern Highlands, stretching from the Murray basin northward to Central Queensland. New South Wales has more than half of Australia's sheep. The east coast lands have damp climate and therefore sheep are few there. Other areas in Australia are Queensland (20 p.c.), Victoria (15 p.c.) and West Australia (10 p.c.). The important wool-collecting centres are Sydney, Albury, Melbourne, Geelong, Bailaret and Brisbane.

Next in degree of importance are the U.S.A., Argentina and New Zealand. These four countries supply more than 50 per cent of the world's total wool. In New Zealand the dry slopes and plains on the coastal sides of the South Islands supply large flocks of sheep. The rich character of the country's pasture land is indicated by the fact that it supports between 31 and 32 million sheep.

Wool can be divided into two classes—apparel wool and carpet wool. Apparel wool is produced in Australia, Argentina, New Zealand, South Africa, Uruguay, U.S.A., and U.K. while U.S.S.R., China and India produce carpet wool.

CHIEF WOOL-PRODUCING COUNTRIES IN 1946-47

(In metric tons—000 omitted)
(One metric ton equals 19·67 cwt.)

Australia	454	South Africa	86
U. S. A.	154	United Kingdom	27
Argentina	211	U. S. S. R.	118
New Zealand	168	India	36
Uruguay	72	China	41

The world trade in wool is dominated by the countries of the Southern hemisphere. The principal importing countries are U.S.A. (45 p.c.), U.K. (22 p.c.), France (9 p.c.), Belgium (5 p.c.) and Germany.

The world production of wool in 1948 was estimated at 3,830 million lbs. The share of each continent in the production was as follows: North America 312·5 million lbs., Asia 332·5 million lbs., Africa 278 million lbs. and South America 786·8 million lbs.

The present world consumption of wool has gone up by 10 to 15 per cent above the pre-war years and therefore the scarcity of fine grade wool has become apparent. Research has been undertaken in New Zealand, Australia, South Africa and U.S.A. to study the medium and coarse wool fibre with a view to increasing their usefulness.

Camel gives hair from its mane and hump. Camel-wool is important in Iran, Arabia, Asia Minor, North Africa and Central Asia. Other important wool-producing animals are the *Angora goat, the Tibetan goat, the Alpaca* and *the Lama.* The Angora goat from South Africa supplies 'mohair' wool. The Tibetan, a native of Tibet, Kashmir and Southern China is important for its soft wool which is made into 'Kashmere' shawls. Peru and Bolivia rear the Alpaca from which the wool 'alpaca' is obtained. *Alpaca* is used for linings, braids and light cloths. Llama, a native of Peru, yields a wool equal in quality to Alpaca.

The by-products of the animal industry are of great importance. These are bones, horn, hide, fat, hoof etc. Bones are useful for making buttons, combs, toilet articles and the like. Leather is of great importance to men. Not only boots and shoes are made of it, but also bags, suit-cases, trunks, harnesses, chairs, machine-belts, automobile seats, cases for guns and sundry other things. The demand for leather is increasing. The most valuable supply of leather materials comes from cattle, horses, sheep and goats. Argentina, Uruguay, Central America, Russia, Canada and South Africa supply cattle-hides. Germany and the U.S.A. are the leaders in tanning industry (cattle-hide). More than 70 per cent of the U.S.A.'s leather production is accounted for by cattle-hides. Goat-skins are important in India, China, Spain and Brazil.

These animal products are mostly raised in those areas where the meat-packing industry is important. Furs are obtained from fox, mink, squirrel and ermine of the cool temperate lands.

Animals are of great use for transportation and draft. As beasts of burden elephants, horses and camels are doing great service to man,—without them human beings would hardly have progressed. In the desert areas camels are the beasts of burden and the only means of transport.

Although with the development of mechanical transportation the importance of draft animals has decreased, there are still many countries where animals are the only transporting agents. In the extreme North or South, reindeer and dogs are not only the beasts of burden but also the only means of transport. In India, which is essentially an agricultural country, cattle are employed in the fields. Even in Europe and America, where agriculture is practised on scientific methods, horses are useful in cultivation.

QUESTIONS

1. Describe the industries of (*i*) Sheep rearing and (*ii*) Dairy farming as they are carried on in the countries of the British Empire. —(I. P. S. 1932).

2. What are the conditions of success in the production of commercial wool? Illustrate your answer with reference to countries of the British Empire. —(I. P. S. 1931).

3. Describe the distribution of sheep in North America, Australia, and New Zealand. Under what conditions does this animal thrive best? —(Cal. B. Com. 1929).

CHAPTER VII

FOREST AND LUMBER INDUSTRIES

Nearly one-fourth of the land surface of the earth is covered with forests. Their distribution is essentially climatic.

Continents	Acres in million	Percentage of forest to total
Asia ...	2096	22
South America	2093	44
North America	1444	27
Africa ...	797	11
Europe ...	774	31
Australia ...	283	15

Roughly two-thirds of the total forest area is classified as productive.

Forests have direct and indirect utilities.

The indirect utilities are the following:—(*i*) Forests render the climate more equable and contribute to increased rainfall. (*ii*) They increase the fertility of the soil. Forests are effective agents in the conservation of soil and moisture. By preventing rapid run off, by promoting percolation of rain water and by the binding effects of the roots on the soil, forests exercise a protective effect on the soil, on steep hill slopes where the danger of fluvial soil erosion is also the greatest. They similarly exercise a beneficial protective function against desiccation and erosion caused by winds on flat country. (*iii*) They decrease the velocity of the air-current.

The direct utilities of forests relate chiefly to their produce, such as timber and firewood, and the raw materials they afford for various industries. Timber is used for making boxes, crating, house-building materials, furniture, masts and decks of ships, etc. The pulp produced from wood is the most important raw material for the manufacture of paper and rayon. The other uses of timber of distillation, dye-stuffs, fence posts, etc. Various other forest products are rubber, gutta-percha, quinine, tar, turpentine, resin, cork, etc. Another important use of forests is that they provide scope for the grazing of cattle.

MAJOR USES OF WORLD'S WOOD*

Uses	Million metric tons	Per cent
Fuel	640	54
Construction	400	33
Paper	60	5·0
Sleepers	25	2·0
Mines	20	1·6
Rayon	5	0·4
Others	50	4·0
	1200	100·0

Forests are a source of revenue to the State. They also afford to the villagers who live near by a ready supply of materials for house-building, fuel, and minor forest products which add to the comforts of their lives.

There are three main classes of forests: (i) Coniferous soft wood, (ii) Temperate hard wood or Deciduous, (iii) Tropical hard wood or Evergreen.

Coniferous soft wood consists of pine, firs, spruces, larches, cypresses and junipers. One-half of all the world's wood is to-day cut trom the coniferous forests which are most widespread in cold, snowy regions like Siberia and Canada. The slopes of the Himalayas at an altitude of 5000 to 7000 ft. around Kashmir, certain remote mountains in the Western China near the Tibetan border, the Andean slopes of Southern Chile and New Zealand have many coniferous trees. The pine is the most important soft wood and is the chief timber for commercial purposes. It is used for the masts and decks of ships, for the manufacture of materials for houses, for the making of packing cases and boxes and in the manufacture of matches. It is obtained mostly from the forests of Canada, Norway, and Sweden; it is also cut in the east of the U. S. A., in Tasmania and in New Zealand.

The temperate hard wood or Deciduous wood like oak, birch, beech, maple, ash, walnut and elm are mostly used in the manufacture of furniture. In the world as a whole, the temperate hard wood furnishes 40 per cent of the total cut and is found best in the Alps, the Pyrenees, Central Russia, the middle region of Siberia, Japan, the Appalachian region in the U. S. A., Patagonia and Southern Chile.

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* Source: *The coming age of wood* by Simon and Schuster (1949).

Tropical hard wood or evergreen forests include teak, mahogany, ebony, rose wood and dye wood. The three great regions are the forests of the Amazon, known as Selvas in South America, the forests of the Congo basin and the Upper Guinea Coast-lands of Africa, and the forests of Indonesia. The tropical forests contain cabinet timber and dye woods. The chief varieties used for making the best furniture are mahogany, ebony and rose wood which are mainly found in Central America and West Indies. The best quality mahogany is found in Haiti, and the inferior types come from Cuba, Jamaica and Mexico.

EUROPE: Nearly one-third of Europe is forest-covered. The continent produces 10 per cent of the world's total supply of forests. *Scandinavia, Finland, the Baltic States and Northern Russia* are covered with coniferous forests. The lumbering and timber industries in these countries have developed to a great extent because rivers provide easy transport and cheap mechanical power. These regions are Europe's major exporters of wood products such as lumber, ties, mine props, pulp wood and other products. In central and Western Europe, the forests are man-made. Land which is too rough or too elevated for profitable agriculture is planted to trees.

Sweden is the most important timber-producing country in Europe. Window frames, paper, matches, wood pulp and plywood form nearly 40 per cent of Swedish exports. In *Norway* the forests cover nearly one-fourth of the total area. The forest products constitute about one-third of the total exports. Norway does not supply much wood to other countries but uses it as the basis of manufacturing industries, such as the manufacture of pulp, newsprint, cellulose, cardboard, matches and paper. As the coast of Norway is ice-free throughout the year, shipping is least inconvenient.

Russia contains more than one-third of the total forest-land of the world. There are vast resources of pine, fir, larch and spruce which are used for timber, paper making and the manufacture of cellulose. The magnitude of the industry can be judged from the fact that while Soviet Russia produced 112 millions of metric tons of timber in 1935, Canada, the second largest producer, raised only 48 millions of metric tons.

NORTH AMERICA: Nearly twenty per cent of the world's forest areas are confined to North America. *Canada* is known as *"the Empire's storehouse of soft wood supplies"*. Her output of timber is greater than the combined production of the next five leading producing countries. In 1950 Canada had a production of 14 million cubic metres of soft wood. British Columbia, Northern Prairie provinces, Ontario, Quebec and New Brunswick have developed lumber industry. The Canadian forest industries, in order to offset depletion of the forest lands, have adopted modern planning methods, and undertaken reforestation schemes. Canada is the second largest producer of paper with about 110 pulp and paper mills. The manufacture of pulp and paper has been one of the major reasons for the huge development of water power in Canada. In 1950 Canada produced 8 million metric tons of pulp. There are two important belts of soft wood in the *U. S. A.* The first, in the east, includes New England, Appalachian Highlands, and the Atlantic coastal plain; the other, on the west, is located in the Rocky mountains and the Pacific slopes. In 1950 the U. S. A. produced 69 million cubic metres of soft wood timber. The forests of the U. S. A. cover nearly 30 per cent of the total area. The U. S. A. today produces 40 per cent of the world's wood pulp and 60 per cent of the world's paper. The important pulp and paper manufacturing regions of the U. S. A. are the north-eastern region, the upper lake region and the Pacific north-west region.

In 1950 the U.S.A. produced 13·4 million metric tons of pulp out of world's total of 30·3 million metric tons.

ASIA: Asia possesses 28 per cent of the world's forest. *Siberia* is covered with coniferous forests, but the difficulties of working them as a result of climate and inadequate means of communication are responsible for the slow development of lumbering industry there. Japan, China and India are also liberally gifted with forests.

India is very rich in forests, which cover more than one-fifth of the total area of the country.

Broadly speaking, there are four types of forests in India:

(*i*) Deciduous forests, extending over large areas in the Sub-Himalayan tract and Peninsular India.

(*ii*) Evergreen forests, occurring in those areas where the rainfall is heavy. Such regions are the west coast of the Peninsula and the eastern Sub-Himalayan tract.

(*iii*) Hill forests, varying according to elevation and rainfall. In the Eastern Himalayas and Assam the forests are full of oak and magnolia, while in Assam and Burma pine trees grow abundantly at an elevation of 3,000 to 6,000 ft.

(*iv*) Littoral forests, *i.e.*, forests on the sea-coast, the most characteristic trees of which belong to the mangrove family.

It will be seen that almost all the forests in India are located in the hills.

Pakistan has arid country forests, extending over Sind, part of Baluchistan and the south of the West Punjab. The most important tree is the babul.

One alarming feature to be noticed in lumber industry of the world is that the consumption is greater than the growth in every country. "At present the amount of timber cut annually in the world is on an average 30 per cent greater than the growth of young trees." In Europe and America, the conservation of forest is practised, that is to say, only mature trees are cut: young and seed trees are allowed to grow. In *Canada,* the policy of the Government is to encourage the "cultivation" of timber for the obvious fact that saw-mills and paper-mills cannot rely on "forest-trees".

Although the consumption exceeds the growth, it is assuring to note that there are great reserves in South America, Africa, South-Eastern Asia and the East Indies. In these areas, the forests grow rapidly because of the climatic conditions. But the poor transportation facilities in these areas have made the exploitation of the forest products somewhat slow and halting. A complete survey of world's forest resources has never been possible, but such measurements as have been made indicate that the standing timber covers an area of about thrice the size of North America.

The world production of wood has been definitely on the increase since the end of World War II. In 1946, the world production of wood was estimated at 1410 million cubic metrics of round wood, weighing about 1000 million metric tons. The value of this production was 7100 million dollars.* The importance of wood in world economy can be appreciated from the fact that this aggregate value is more than three times the value of the annual output of coal.

QUESTIONS

1. What are the principal forest regions of the tropical zone? Describe their commercial importance.

2. Describe the forest resources of India and show how far they have been commercially exploited.

3. What are the sources of British timber? Describe the timber-producing areas in the British Empire.

4. Describe the forest regions of the temperate zone. Discuss in this connection the importance of forest-products of Scandinavia and the Baltic States.

5. On a sketch map of India, show the regions with important timber resources. How are these utilised at present? Discuss the prospects of increasing exports of Indian timber to the world's markets.
—(Cal. B. Com. 1940).

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* *Year Book of Forest Products Statistics* by U. N. Food and Agricultural Organisation.

CHAPTER VIII

TRANSPORT

Commerce is defined as the sum-total of those activities which are concerned with the removal of hindrances connected with persons, places and time in the exchange of commodities. The hindrances connected with persons and time are removed by traders, while those connected with places are removed by means of transport.

The transportation system was at first very simple. Man and animal were the only means of transport. At present, man calls to his service water, wind, steam and electricity for carrying goods not only in the local areas but also over long distances. A journey which required months a hundred years ago can be completed to-day in a few days. The continuous development of air-service has further shortened the distance between different places. Indeed, we may say that the world has become smaller than what it was fifty years ago.

Generally speaking, *transport means movement of goods from one place to another.* Transportation is an important factor in production and distribution, and as such it may be considered as the life-blood of commerce. The growth of domestic and foreign trade is dependent on it. There is no civilised country which is not dependent on other regions for food or raw materials. All the countries of Western Europe look to the Americas and Asia for supplies of food and raw materials. Canada and Argentina would not have raised wheat had there been no provision for rapid and cheap conveyance by land and water, for these two countries cultivate wheat mainly for European markets.

Commodities are manufactured on a large scale, because the problem of distance has been largely solved. Transportation has made possible the colonisation of many new lands. The Americas, Australia, South Africa and New Zealand have been colonised by the European peoples.

KINDS OF TRANSPORTATION SYSTEMS

Land	Water	Air
1. Man	1. Rivers	(*a*) Aircrafts heavier than air
2. Animal	2. Canals	
3. Roads	3. Lakes	(*b*) Aircrafts lighter than air
4. Railways	4. Oceans	

The modes of transport are different in different countries, because of relief and climate. In a few countries all the systems are present, while in others only two or three types are employed. In the Tundra Region dogs and reindeer are employed for drawing wheelless vehicles on snow, while camels are the only source of transport in the deserts.

In many countries man himself is the only means of transport. In Central Africa, China and Japan beasts of burden are few and men are employed to carry loads for short distances. The relief and climate of Africa from the Sudan to the Zambesi are such that it is very difficult to construct roads and railways. Negro porters carry ivory, rubber, palm-nuts and other products of the Savannahs. Even in areas where beasts of burden are available, it may not be possible for men to use them. The slopes of the mountains may be too steep for animals, as in some parts of China, Tibet and Chile, or harmful insects may prevent the use of transport animals as in Central Africa, the Middle Amazon basin, etc. In such regions heavy loads are moved by coolies. It should be noted that employment of human labour for carrying loads for long or short distances is found only in the backward countries. This mode of transport is so expensive that the cost of carrying goods to a distance of 150 miles is three times the freight usually charged for a voyage of 8000 miles.

Man employs many animals in his service and also employs them as his beasts of burden. The horse is the common transporting animal in the temperate lands. In the hot deserts of the Old World, camels carry heavy loads and can travel more than thirty miles a day. Elephants are employed in India and Burma and parts of Africa to carry loads and they render valuable service in the teak forest of tropical Asia. The Yak is the beast of burden in the mountainous regions of Northern India and

Tibet, and the mule is serviceable in the mountain areas near the Mediterranean Sea and Mexico. In the north-west of Canada and in Siberia, sledges are drawn by hardy dogs over the frozen snow. The reindeer has been introduced in Alaska and parts of Canada.

The most economical way of using the beasts of burden is with wheeled carts which, of course, require some sort of road. Of all land routes, road is the most ancient as well as the most universal. A nation's natural resources can best be developed under a system of good roads. Poor roads permit limited intercourse and hinder exchange, and as such keep a country backward.

Roads are a great feature of transport in every commercial country. They are always very useful in the collection and distribution of goods. Wheeled vehicles which use roads may be drawn by animals or mechanical power. Motor vehicles are swift and sure, and have been introduced in every civilised country. When the roads are levelled and macadamised, motor vehicles can be employed with full advantage. The use of motor vehicles has led to the rapid expansion and improvement of roads during the past 40 years in almost every country. Transport operations are now performed by automobiles in the deserts of Sahara and Arabia.

ADVANTAGES OF ROAD TRANSPORT

1. Road transport yields service more easily than the railways or the waterways, because on the roads no transhipment is necessary.

2. The rural areas can best be served by road transport because railways cannot give efficient service to these areas as the traffic is small. Big cities like Calcutta, Bombay, etc., generally collect the produce of the adjoining rural areas by road transport.

Countries	Motor-road-mileage (1 km. equals ⅝ of a mile)	Number of motor vehicles (in millions)
U.S.A.	.. 3,000,000 miles	30·1
France	.. 650,000 km.	2·2
Great Britain	.. 177,000 miles	2·6
Germany	.. 274,000 km.	1·9
Canada	.. 394,300 miles	1·4

U. S. A. possesses nearly one-third of the total road mileage of the world. There are more than 3,000,000 miles of roads in the country out of a world-total of 9,225,000 miles. Motor traffic in the U. S. A. is the heaviest in the world. It has more than 75 per cent of the motor vehicles of the world (one vehicle for every four persons).

Road conditions are not favourable to the development of motor transport in Canada. It has a little above 390,000 miles of roads of which nearly 40 per cent are earth-roads. These earth-roads are closed to traffic during the long winter. The province of Ontario has the largest road mileage and possesses nearly 50 per cent of Canada's motor vehicles.

India has a little over 200,000 miles of roads of which only 65,000 miles are motorable. Considering the size and the population of the country, the road mileage is very poor indeed. Good road communication is essential in a country like India which is predominantly agricultural. It is now felt that to help the country to continue the development of its potential wealth, roads must be opened and improved.

The other two modes of land transport are tramways and railways. Trams are run by electricity and are used in and near big cities. For long distance tram cars are not suitable, and hence railways are universally used. Speed and capacity for carrying heavy goods account for the great development of railways throughout the world.

Railways is the most important means of inland transport. It has opened up new countries for settlement, which otherwise would have remained sparsely populated. Canada and Siberia are countries where railways have opened up new lands.

The construction of railways is influenced by physical factors like climate and topography. Climate has a considerable influence on railways. Snow may block passes and impede railways and heavy rainfall may undermine embankments. In the Arctic Zone it is almost impossible to construct railways as the land is always covered with ice and snow. The heavy rainfall of the Equatorial Region makes the soil unsuitable for the construction of railroads.

The relief of a country directs the course of railways. Mountain-barriers also exclude or deflect railways. It is easy in plains to construct railways, but the difficulty in mountainous lands is sometimes insuperable. In order to cross the great highlands, tunnels are sometimes used. Deep cuttings and long tunnels are avoided wherever possible, because of their high cost.

LENGTH OF RAILWAYS IN THE PRINCIPAL COUNTRIES

U.S.A. (1942)	242,744	British Isles (1937)	22,915
U.S.S.R. (1940)	60,000	Japan (1937)	15,254
Germany (1939)	42,299	Poland (1937)	12,700
Canada (1941)	56,700	Union of S. Africa (1943)	13,244
India (1940)*	41,156	Italy (1938)	14,550
Australia (1942)	27,962	Chile	5,200
Argentina (1943)	26,249	Belgium (1939)	3,189
France (1938)	26,427		
Brazil (1943)	24,000		

RAIL VS. MECHANICAL ROAD TRANSPORT

Roads are very important even in this age of railways, for they are the feeders of railroads. Great Britain, Germany, France and the U. S. A. have excellent roads. At present motor vehicles are competing with rails in many countries. For rapid and short distance service, motor vehicles are very convenient. In the case of railways, much delay is caused by terminal services, shunting operations and collection and delivery of goods. But over long distances railways offer rapid, economical and reliable service, especially in the case of bulky and heavy goods. Road transport is more flexible than railway transport, because motor vehicles, not being dependent on railway lines, can go wherever there are roads. Rural areas can be best served by roads ; railway-operations are generally unprofitable in these areas as the volume of traffic is not large.

SOME IMPORTANT TRANS-CONTINENTAL RAILWAYS

1. The Trans-Siberian Railway.
2. The Trans-Caspian Railway.
3. The Cape-Cairo Route.
4. The Canadian Pacific Railway.
5. The Chile-Argentine Railway.

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* Pakistan has 1,600 miles of railway lines.

The Trans-Siberian Railway connects Russia with the Far East. It runs from Moscow to Vladivostok on the Pacific, the distance being 5,400 miles. The settlement of Central and Eastern Siberia is largely due to this railway system.* It has additional value as an alternative route between Europe and Asia on the Pacific for passengers and mails. The line was constructed by the Czarist Government for the purpose of facilitating the work of administration in Asiatic Russia. It is a single-track system. From Moscow the line goes to Omsk after crossing the Urals and traversing the agricultural lands of Northern-Steppe provinces where wheat-fields are prominent.

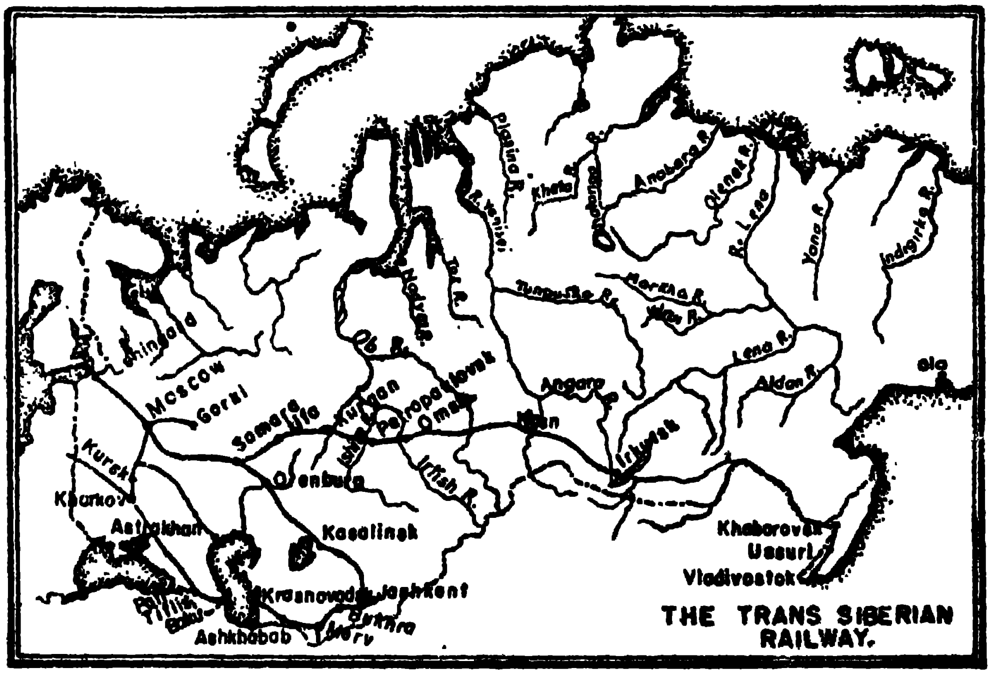

Fig. No. 41. The Trans-Siberian Railway. Note that Moscow is connected with Leningrad. From Omsk a branch line has gone as far as Tashkent.

From Omsk the line goes directly eastward, crosses the Obi and the Yenisei and soon reaches Irkutsk and Lake Baikal. The distance between Lake Baikal and Moscow is 3,420 miles. The line then goes from Lake Baikal to the Amur valley and passes through Manchuria and finally reaches Vladivostok. In Manchuria, a southern branch has been opened at Harbin which connects Port Arthur *via* Mukden. Mukden is linked up with Peiping by rail.

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* This railway is regarded in the Soviet Union more as a political or strategic link than as a trade route.

The Trans-Caspian Railway connects Central Asia with European Russia. *It is also a part of the possible railway route between Europe and India.* The line runs from Krasnovodsk, on the Caspian Sea, to the heart of the cotton-growing region of Turkestan, throwing off a branch on the Afghan frontier from Merv to Kushk. Krasnovodsk is connected with Moscow *via* Tashkent.

The Canadian-Pacific Railway was built during the years 1882-86. The length of the line is 3,500 miles. This line connects the Atlantic coast of Canada with its Pacific coast. This line shortens the journey from Liverpool to China and

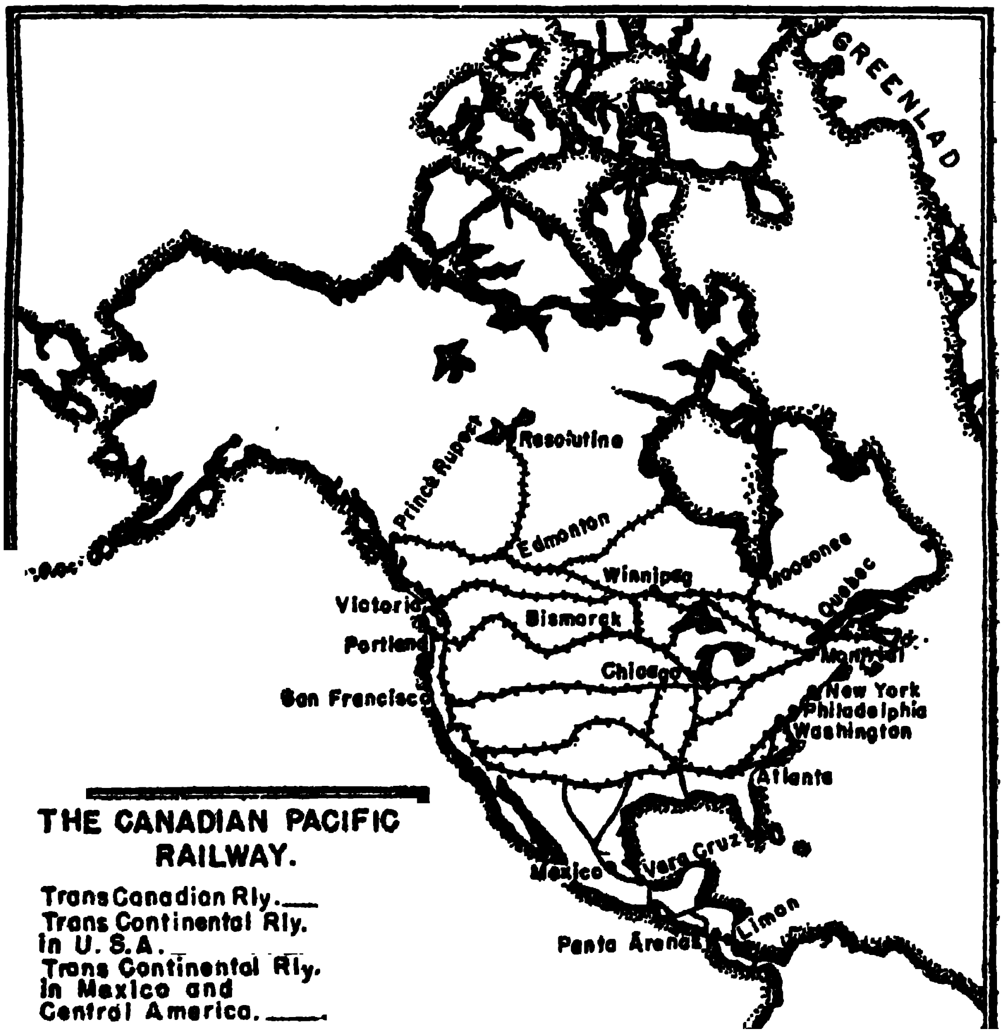

FIG. No. 42. The Canadian Pacific Railway. Note how the Canadian system is connected with the U.S.A. railways at Chicago.

Japan by 1,200 miles. The line runs from Halifax and St. Johns to Montreal. From Montreal it goes to Winnipeg, the great wheat centre of Canada. The line crosses the plains from Winnipeg *via* Regina and reaches Medicine Hat in the Rockies. Leaving Medicine Hat, it goes through Kicking-Horse-Pass, and ends in Vancouver.

This railway system has played a very important part in the political and economic life of the Dominion. Geographical conditions like distance and climate placed considerable difficulties in the way of colonisation in Canada. Waterways rendered inestimable service no doubt, but they were closed to traffic during the winter months. The Canadian-Pacific Railway now permits the scattered population of the Dominion to maintain constant intercourse. Thus the history of Canadian railways is the history of Canada's growth as a nation.

The Chile-Argentine Railway of South America connects Buenos-Aires with Valparaiso ; the distance is nearly 900 miles. This route was opened for traffic in 1910. As there is a change of gauge both at Mendoza on the Argentine side and at Los Andes on the Chilean, the route is useful only for the carriage of passengers and mails. Of the four trans-continental lines in South America none is more important commercially than the Chile-Argentine line. The interchange of products between the eastern and western zones of the Continent is small.

Cape-to-Cairo Route : The distance from Cape to Cairo is 9,000 miles, which is traversed by rail, river, lake and road. It was a scheme of Cecil Rhodes to connect the Cape with Cairo by an all-British railway system ; but the scheme could not be worked out. A railway line from Cape Town goes up to the border of Belgian Congo *via* Bulaways and Elizabethville. From Elizabethville, the capital of Kantanga, a river-cum-caravan route proceeds to Lake Victoria, from where a motor road runs to the Nile Gorge. From here steamers maintain regular service to Khartoum. From Khartoum a railway line goes to Wadi Haifa, thence by river-transport Shellal is approached. From Shellal a train runs to Cairo.

Water Transport

Water transport may be inland and oceanic. Inland waterways include navigable rivers and canals, while under ocean transport come seas, oceans and sea canals. Water transport is cheaper than land transport because waterways provide ready-made highways, and the right to navigate them is often free. But water transport is attended with a great disadvantage : it is slow and uncertain.

Rivers are the most important highways of commerce. A river, in order to be useful for navigation, must be deep and free from ice. Swift currents and falls make a river dangerous for navigation. Rivers should have a constant flow of water. The importance of rivers increases when they flow towards ice-free oceans or seas through regions of rich products and dense population. The rivers flowing towards the Arctic Ocean or inland seas have limited and restricted traffic.

River systems of Europe, Asia, Africa, Australia, North America and South America

Europe has a large number of rivers suitable for navigation. The Alps is the main source of most of the rivers of Europe.

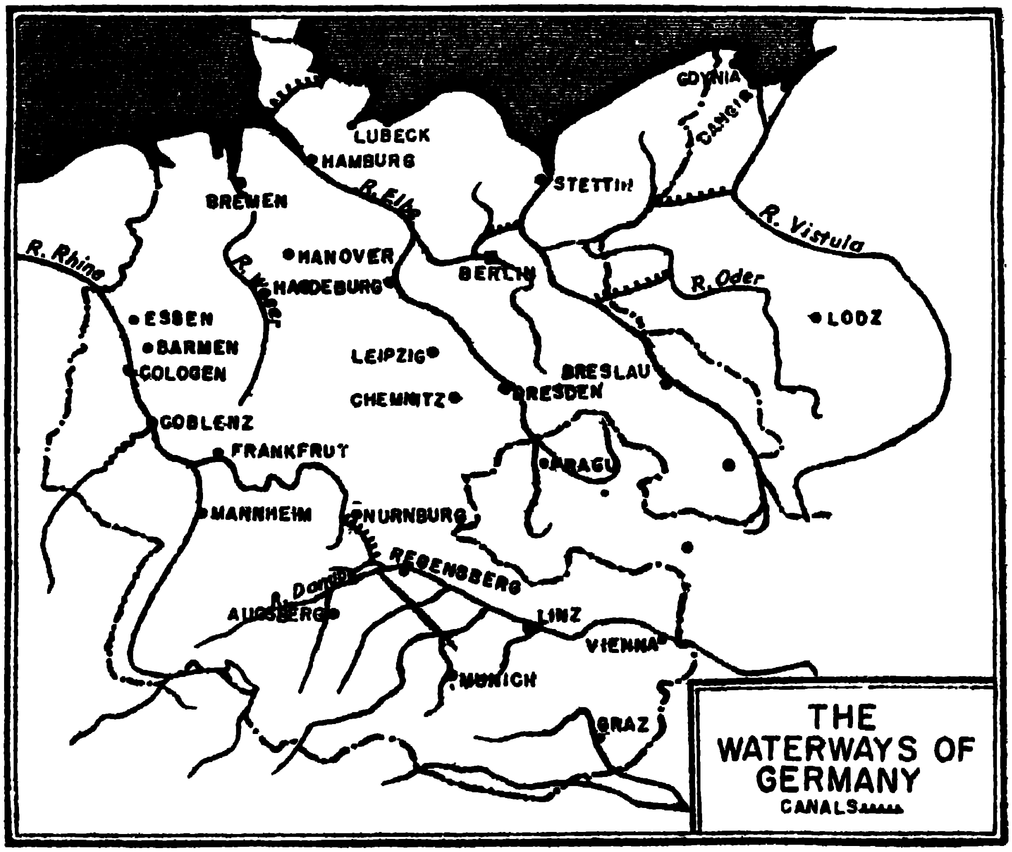

FIG. No. 43. The waterways of Germany. Note how the rivers are flowing diagonally from south-east to north-west.

The Rhine after 235 miles in Switzerland flows into the North Sea. The Rhine reaches the French frontier 165 miles away from its source in the glaciers and turns south to the Mediterranean. The Inn feeds the Danube and the Ticino flows from the Gattard to join the Po. Among the European countries *Germany is exceptionally fortunate in having large navigable rivers.* What Germany lacks in coast-line, she makes up by her large navitagle rivers. And probably in no other country are such big manufacturing and industrial towns to be found on river banks as in Germany. The Rhine, the largest river in Germany and the most important in Europe, has perhaps the most voluminous traffic in the world. Sea-going steamers now land their goods at the river port of Cologne. It is navigable by steamer as far as Maine, Mannheim and Strassburg. The other big rivers of Germany are Wesser, Elbe and Oder. The Elbe is not only navigable within the German boundary but it is also easily navigable from Prague to other parts of Czechoslovakia. There are important towns on the Elbe, such as Dresden, Magdeburg and Hamburg. The Oder is also navigable and flows through the rich mining and manufacturing regions of Silesia. Breslau and Frankfurt are the two important towns on the Oder.

The rivers of Germany mostly flow diagonally from south-east to north-west. They are all connected with one another by canals. The Weser is connected with the Elbe at two points —Magdeburg and Hamburg. The Hansa Canal gives direct water communication of the Ruhr coal-fields to Hamburg. Ludwigs canal connects the Danube with the Maine, a tributary of the Rhine.

France is not far behind Germany in the extent and utility of inland waterways. To secure the maximum benefit through inland communication by water as far as practicable, the most important rivers have been joined with one another. The rivers are navigable except in their upper courses. The Rhone, which is 500 miles long, is of little importance, but the Seine is a first-class water-way. The Seine with the tributaries, the Youne, Marine and Oise, rises in the hills of Burgundy and flows northward to the English Channel through the Paris region. The river is navigable and provides valuable traffic. The Loire, which flows to the Bay of Biscay, is navigable as a commercial waterway. The Dordogne and Garonne are navigable and have important traffic.

There are many large navigable rivers in Russia. These are the Dvina, Volga, Don, Dnieper and Dneister. They mostly flow either to the Arctic Ocean or to the inland seas like the Caspian, the Baltic or the Black Sea. This is a serious defect because the north is ice-bound during winter and closed to navigation, and the inland seas have no outlet. In spite of such defects the Russian rivers are very important for domestic and foreign trade. The Volga is the second important river in Europe. It binds the trade of the south with that of the north in Russia. But as it flows to the Caspian Sea—a land-locked sea, its navigation is important only between local centres along its course.

Australia is deficient in waterways. Her river-system consists of small streams flowing from the highlands to the coast. Her eastern rivers are navigable for short distances during the wet seasons only. The two most important rivers are the Murray and the Darling. The Darling rises in the Eastern Highlands and flows for over 900 miles over the gentle gradients of the plains. In winter and spring, the river is almost dry. The Murray rises in the Australian Alps and is fed by the melting snow as well as by the copious rains of that part. The Murray and its tributaries are very important for irrigation, which consists in damming up the rivers at convenient places and holding back the waters for use in channels which lead to the fields. The Murray was at one time important for navigation but now because of the motor lorries, the water-borne trade is meagre. The south bank of the Murray is the boundary between Victoria and New South Wales.

In the St. Lawrence and the Great Lakes, *Canada has the most magnificent inland waterways in the world.* In addition to this wonderful system, there are many large lakes and thousands of miles of navigable rivers. There are three chief hindrances to navigation on the St. Lawrence and the Lake system: (1) frequent fogs near the mouth, (2) ice in winter, (3) rapids and falls. Searchlights and horns are used to avoid accidents arising out of fogs. During winter ice-breakers keep the river fit for navigation. The obstruction caused by rapids and falls has been successfully removed by deepening the river and constructing canals. The more important of the other navigable waterways of Canada are Red River, Albany, Saskatchewan, Mackenzie and Yukon. The less important rivers are Fraser, Skeena and Columbia. With the exception of the St. Lawrence and the Great Lakes, the traffic on the rivers of Canada is rather of a local character.

U. S. A. is well furnished with a network of waterways covering nearly 20,000 miles. The two most important rivers are the Missouri and the Mississippi. The Mississippi is navigable for 2,000 miles from its mouth to the port of St. Paul. The Upper Mississippi carries an immense volume of traffic throughout the year, but the Lower Mississippi is scarcely used. The great defect of the river is that it suffers from heavy floods. The Ohio, a tributary of the Mississippi, is navigable up to Pennsylvania and carries much coal traffic. The Missouri, which joins the Mississippi at St. Louis, can be navigated almost to the foot of the Rockies. It is also subject to great floods. The proximity of the sources of the Mississippi and the St. Lawrence has made it possible to connect them by means of canals.

The rivers of South America are very important for commerce. Almost all important rivers flow to the eastern coast. The rivers flowing to the west coast are of little use for navigation. The Amazon is the longest river of the Continent which provides with its tributaries 50,000 miles of safe navigation in the wet season and some 20,000 miles in the dry season. The tributaries of the Amazon are also navigable. Up till now the Amazon system is of relatively little use, because the region through which the river flows is densely forested, scantily populated, undeveloped and largely unexplored. The Orinoco which flows through Venezuela is a long waterway. But the most useful in South America is the Parana system which penetrates the heart of Argentina, Paraguay, Uruguay and South Brazil. In the southern side of South America the river Rio Negro drains the sheep-rearing land of Patagonia.

Rivers are the main highways of commerce in Africa. The Nile is the most important river in north-east Africa, but its great defect is the succession of cataracts. In its upper course the Nile has rapids and falls ; in its middle course there are cataracts. It is navigable in the delta and in its lower course. The rivers of South Africa are of little use for traffic. The

Zambesi is navigable for 250 miles, while the Limpopo can be navigated only for a short distance. The Orange is not navigable. In tropical Africa, the Congo provides a magnificent system of waterways. It rises in the highlands between the lakes Tanganyika and Nyasa. But at several places navigation is interrupted by rapids and falls. The Ubangi, the chief tributary of the Congo, can be navigated almost to its head. In West Africa the Niger is easily navigable for 500 miles and in the wet season navigation is continued further. The Gambia is navigable for 200 miles from its mouth. In Africa rivers will continue to be very useful for commerce for some time more. It is quite likely that in future the great lakes of the Continent will provide valuable waterways.

The most important river systems of Asia are confined to India and China. Northern India is especially endowed with three large navigable rivers which provide more than 20,000 miles of waterways. These rivers are the Ganges, the Brahmaputra and the Jumna. The Ganges can be navigated by steamers as far as Kanpur. This river flows through the most densely populated and fertile plain of India and naturally commands much traffic. Before the development of railways, the Ganges was of considerable importance for the movement of goods and persons. The development of railways has greatly reduced the importance of steam navigation, specially in the Upper Ganges. The Lower Ganges is, even now, very important, and there is traffic all the year round. The Indus in Pakistan is navigable by steamer up to Dera Ismail Khan in the North-Western Frontier Province, 800 miles inland. The river mostly handles wheat, cotton and wool. The Chenub and the Sutlej, two tributaries of the Indus, are also navigable by small steamers. The frequent shifting of its bed and the formation of sand-bar have caused steam navigation in the Indus to be neglected. The Brahmaputra flows through Assam and East Pakistan, and is navigable as far as Dibrugarh. Its tributary, the Surma, has made steam navigation possible in Sylhet and Cachar.

The rivers of Southern India are usually shallow and so do not lend themselves to navigation. Navigation is further impeded by the rocky beds and floods of the rivers. Moreover, they flow in torrents during the monsoon, but becomes almost puddles in deep gorges or rocky beds or a vast expanse of sand in summer. The Mahanadi, the Krishna and the Godavari can be navigated in the upper courses, but traffic on them is not considerable.

Burma is very fortunate in having a large number of navigable rivers. The Irrawady, the most important and the largest, is navigable by steamers for more than 500 miles from its mouth and country boats can proceed farther.

Rivers are the principal highways in China. Three great rivers, the Hwang-ho, the Yang-tse-kiang and the Sikiang, cross the country from west to east. China's greatest river is the *Yang-tse-kiang,* 3,200 miles in length and the most important waterway for navigation in the country. It drains an area of 7,56,500 square miles. In all the world it is doubtful whether there is another equally extensive region of wealth where the people depend as solely upon a single artery of traffic and upon one entrêpot as do the inhabitants of the Yangtse basin. About half of the population of China live in this fertile area, utilizing the river, its tributaries and its network of canals as their chief means of communication. The Yang-tse-kiang rises in Tibet, and with its tributaries drains the heart of China. It is navigable by steamers for more than 1,000 miles from the mouth. Sea-going vessels can use the port of Hankok, 680 miles high, for loading tea and other products for Europe and America. The Yangtse can be divided into three sections. The first section begins in the eastern Tibet where the river has a torrential course and runs for about 1,570 miles. Here this river is called the Kinsha Kiang, the River of Golden Sands. In its second course, the Yangtse becomes semi-navigable near Suifu, 1,630 miles from the sea and continues through Szechan and the gorges of Western Hupei. The province of Szechan is one of the richest areas of China in silk, opium, cotton and minerals. Consequently, the river traffic on this part of the Yang-tse-kiang is very brisk. The third section is from Ichang to the sea—a distance of thousand miles. As the depth is between 30 to 100 feet, the navigation is easy. The *Hwang-ho* also rises in Tibet. It is of little use for navigation as it is swift and shallow. Its name (which means 'Yellow') is due to the colour imparted to it by the yellow loess soil over which it flows. The river sometimes causes so much damage by floods that it is called 'China's sorrow'. The *Sikiang* rises in the highlands of Yunan and has a fairly direct course eastward to its mouth. It is navigable for the greater part of its course. The Pei-ho is important for communication and can be navigated up to Tientsin.

Ocean Transport

Modern international trade is mostly sea-borne. Ocean highways link different countries together and develop foreign commerce. Ocean transport is cheaper than land transport because the long highways on the seas are always ready for use. The countries surrounded or touched by oceans are more favourably placed than those devoid of seaboard.

In number and total tonnage of shipping Great Britain is the leader. The following figures give the relative positions of the different countries in respect of number and tonnage of shipping in the period immediately preceding the second World War.

MERCANTILE SHIPPING OF THE WORLD

(000 omitted)

	1934		1938	
Countries	*No.*	*Tons*	*No.*	*Tons.*
Great Britain	7,469	17,734	6,722	17,900
British Dominions ..	2,498	3,106	2,255	3,100
France	1,567	3,298	1,231	2,900
Germany	2,043	3,960	2,459	4,500
Japan	1,949	4,072	2,337	5,600
Norway	1,908	3,981	1,987	4,800
U. S. A.	3,045	10,354	8,000	11,400
World Total	30,997	65,576	29,763	68,400

During the World War II, the aggregate tonnage of shipping destroyed was so enormous that the work of reconstruction and replacement is being carried on still. On the long-distance routes, there is still much leeway to be made up before condition becomes normal.

Ocean steamers may be classified into two classes: (*a*) liners and (*b*) tramps. The essence of a liner system is the maintenance of regular routes and ports of call, sailing on advertised dates. A liner may be of a passenger liner service or of a cargo service. A passenger liner service is used primarily for the carriage of passengers and mails, and is, therefore, designed both for luxury and speed. A cargo liner, which carries large quantities of merchandise, usually operates on routes where speed is not the main requirement.

Tramp steamers have no regular routes or time of sailing and go wherever cargo is to be had.

Although steamers may cross the oceans in every direction, there are certain definite sea-routes which are followed because of their freedom from navigational hazards.

THE PRINCIPAL OCEAN ROUTES OF THE WORLD

I. *The North Atlantic Route* has the greatest traffic of all ocean routes. Nearly one-fourth of the tonnage of the world's merchant vessels serves this route. In volume and variety of cargo, this route far exceeds any other. This route connects the ports of Western Europe with those on the east coast of North America. These two regions are the most populous and highly developed regions on the earth. North America and

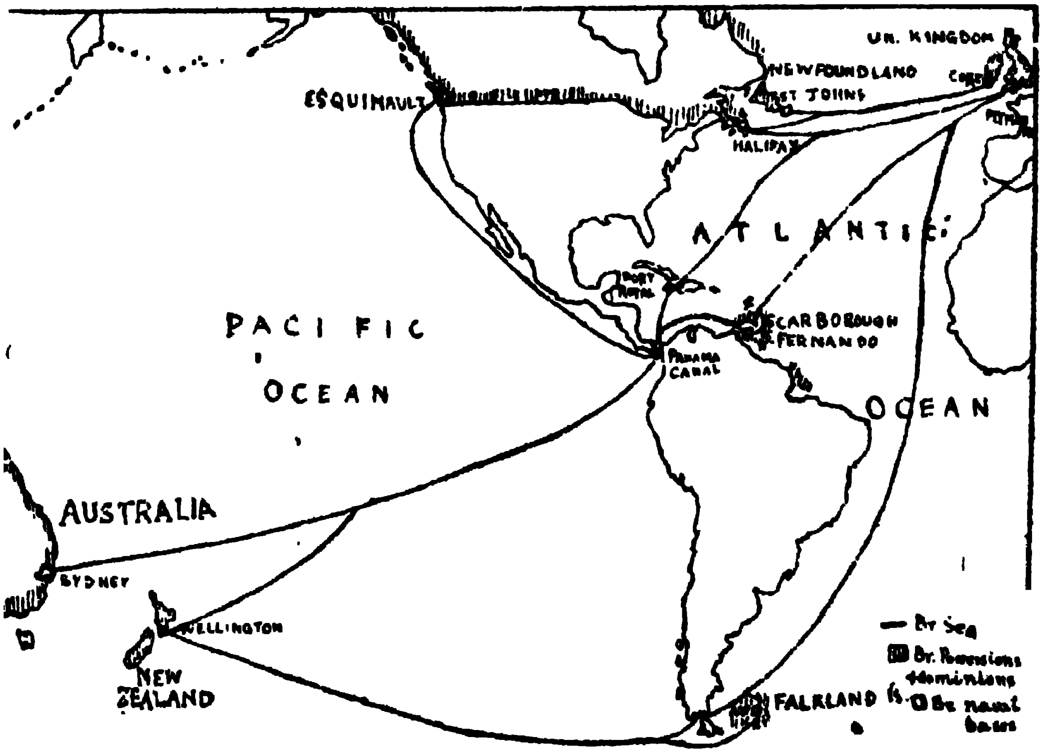

FIG. NO. 44. The Atlantic Routes—one to North America and the other to South America.

Western Europe are the world's greatest producers of goods of quantity and diversity. Ports of departure are Glasgow, Liverpool, Manchester, Southampton, London, Rotterdam, Bremen, Bordeaux and Lisbon. Ports of call are Quebec, Montreal, Halifax, St. John, Boston, New York, Baltimore, Charleston, Galveston and New Orleans. The chief steamship services are the Cunard Steamship Co. and the White Star Line.

The exports of Canada and the U. S. A. to Europe are timber, live cattle, fresh meat, dairy products, leather and hides, fruit, fish, wheat, raw cotton, maize, tobacco, oil, iron and steel, asbestos, etc.

II. *The Panama Route* connects the Pacific with the Atlantic. The important ports of call along this route are Colon, San Diego, Vancouver, Prince Rupert, Callao and Auckland in New Zealand. The chief steamship services are the New Zealand Shipping Co. and the Royal Mail Steam Packet Co.

The Panama Canal has not only opened several routes, it has also altered certain old ones. Before the construction of the Canal the only sea-routes between the eastern and the western sea boards of the Americas was by Cape Horn. The trade relations between the Far East and the eastern coast of the Americas were then maintained by the Suez Canal.

The Panama Canal serves mainly the eastern coast of the U. S. A. in its trade with Australia, New Zealand, Japan, China, and the western parts of South America and North America.

III. *The Suez Canal Route* is second to the North Atlantic in respect of volume of traffic. It commands the markets of Eastern Africa, Persia, Arabia, India, the Far East, Australia and New Zealand. In fact, the route passes through the heart of the world and touches more lands and serves more people than any other route. Through its many ports of call, it reaches about three-quarters of the total population of the globe. After crossing the Red Sea, the route follows two directions—one along the eastern coast of Africa to Durban ; another to the farther east—to India, Australia, etc. Ports of departure are London, Liverpool, Southampton, Hamburg, Rotterdam, Lisbon, Marseilles, Genoa and Naples. The ports of call are Aden, Bombay, Calcutta, Rangoon, Penang, Singapore, Manila,

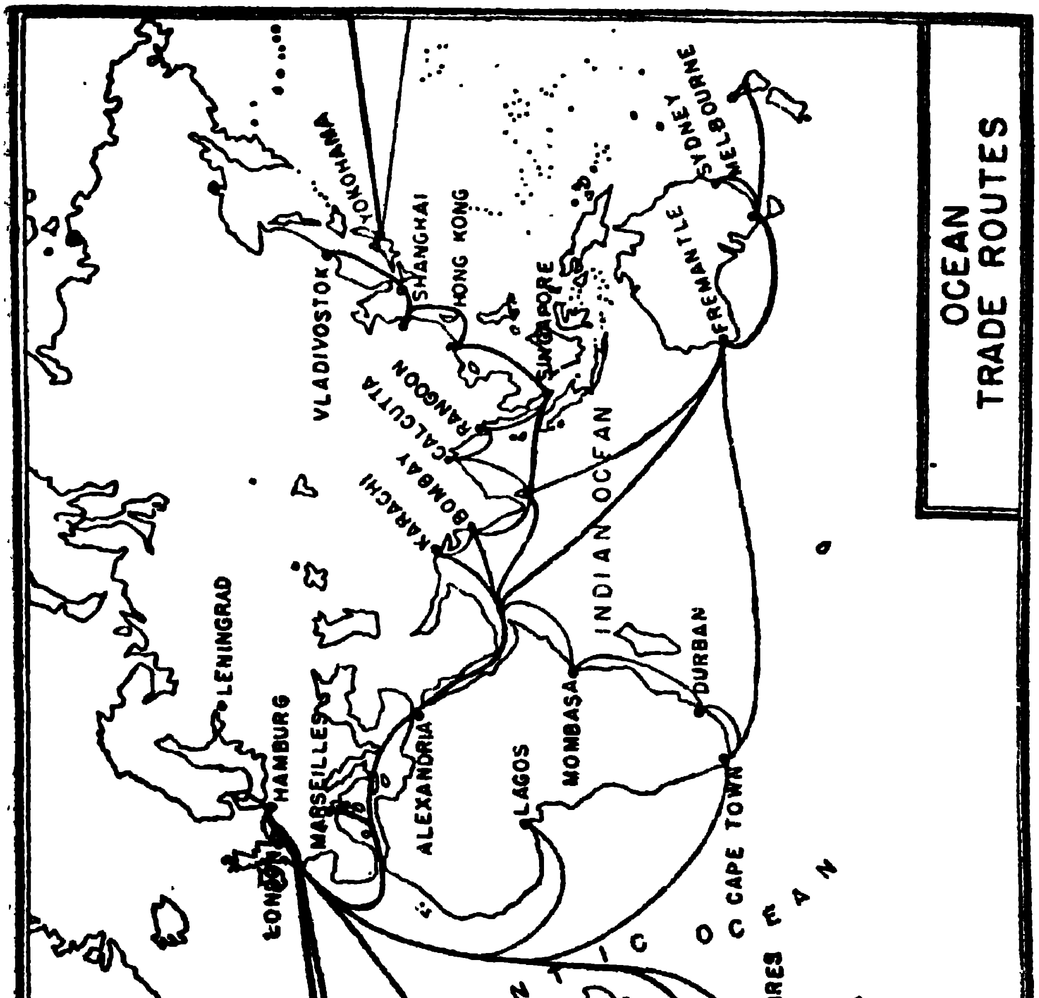

FIG. No. 45. The Suez and the Cape routes. Note that Australia may be approached from Europe by both the routes.

Hongkong, Perth, Adelaide, Melbourne, Sydney, Mombasa, Zanzibar, Mozambique and Durban.

The Suez Canal Company charges a very high canal tax, for which it is not possible for every steamer to avail of the Suez route. Steamers carrying cheap cargo for Australia and New Zealand generally pass through the Cape route. It is interesting to note that nearly half the exports of Australia for Western Europe goes by the Cape route. Sometimes passengers from Europe—mostly colonists—who are bound for Australia and New Zealand prefer the Cape route because of low shipping rates.

This route is served by the Peninsular and Oriental S. N. Co., Ltd., the British India Line, the Australia Commonwealth Line and the Japan Mail Steamship Co. Ltd. The India-owned Scindia-line is also now operating between India and Great Britain.

Along this great highway the East sends its raw materials and food-products to the western markets and receives in return manufactured articles. The products of China and Japan are rice, tea, sugar and silk ; those of India coffee, tea, rice, wheat, indigo, spices, raw cotton, teak, hemp, silk, skins, leather and oil-seeds. From Australia fresh meat, timber, wheat, flour, fruit, hemp, wool, butter, wine and kauri gam are sent. Pakistan sends jute, tea, hides and skins.

IV. *The Cape Route* connects Western Europe with the western and southern parts of Africa. The route also serves Australia and New Zealand. Many European colonists going to Australia and New Zealand from Europe avail themselves of this route, for it is cheaper than the Suez route. As the western sea board of Africa is economically very backward, the volume of traffic to and from this part is very small. Moreover, the sea is shallow for nearly five to seven miles from the coast. The chief ports on the European coasts are London, Liverpool, Cardiff, Southampton, Swansea, Lisbon and Ascension. The ports of call are Port Elizabeth, East London and Cape Town in South Africa and Adelaide, Melbourne, Sydney and Brisbane in Australia.

The important steamship services are the Union Castle Line, Australian Commonwealth Line and P. & O. Line.

The exports of tropical and South Africa are palm oil, ivory, gum, rubber, cabinet wood, hides and ostrich feathers.

V. *The West Indies and South Atlantic Route* leads to West Indies, Brazil and Argentina. The chief ports of call are Kingston (Jamaica), Havana, Vera Cruz, Tampico, Pernambuco, Bahia, Rio-de-Janerio, Santos, Montevideo, Buenos Aires and Rosario. The exports are sugar, bananas, raw cotton, mahogany, tobacco, silver, rubber, coffee, rose-wood, diamonds, grain, wool and meat.

The chief services are the Royal Mail Steam Packet Co., the Pacific Steam Navigation Co., the Lamport and Holt Line, Elders & Fyffes, and the Imperial Direct West Indian Mail Service Co., Ltd.

This route maintains trade connections between Europe on the one hand and West Indies, Caribbean Sea board, Brazil, Uruguay and Argentina on the other.

VI. *The Pacific Routes* connect western board of North America with eastern Asia. There are two main routes: one, the shorter goes along the Aleutian Islands, and the other which is longer goes via Hawaian Islands. The Panama Canal has also made the Pacific Ocean prominent as a highway of commerce. This route, which is of growing importance, connects Australia and New Zealand with America. The great development of industries in Japan and China has further increased the importance of the Pacific route. The exports of the Far East to America by this route are tea, silk goods, sugar, tobacco, rice, hemp, and carpet, while the imports from the U. S. A. consist of cotton, wool, oil, metal goods, machinery and railway plants. The chief steamship services are the Peninsular and Oriental Line and the Japan Mail Steamship Co., Ltd.

A survey for a sea level canal to link the Atlantic and the Pacific oceans, 200 miles south-east of the Panama canal, has already begun.

CANALS AND SHIP CANALS

Canals are artificially constructed water-channels used mainly for navigation. Canals are mainly dug (*a*) to shorten long voyages by connecting seas, gulfs or oceans, (*b*) to make inland centre ports, (*c*) to avoid falls and rapids of rivers, and (*d*) to enable a country to handle its own traffic within its own borders when its rivers flow through foreign lands. Ship canals are of large dimensions and can admit vessels of great size. As they are usually cut across isthmuses, they greatly reduce the distance by sea between certain countries. They also place great inland towns in direct communication with the sea.

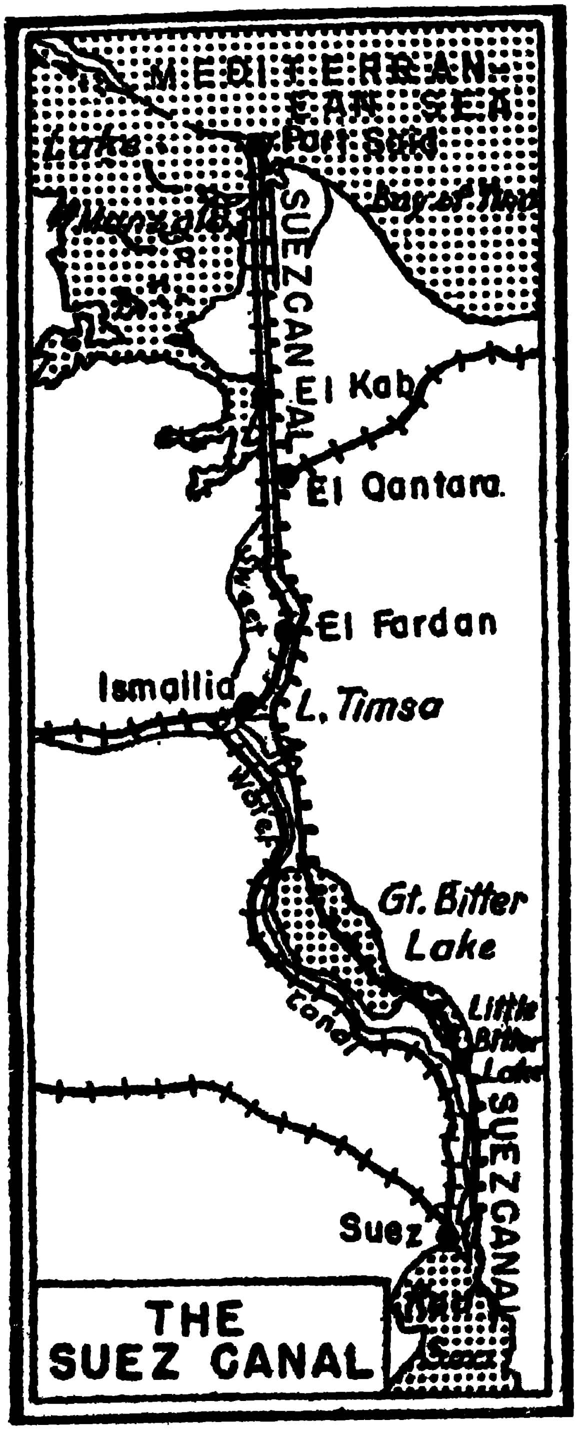

FIG. No. 46. The Suez Canal. The canal is free and open, in time of war as in time of peace, to every vessel of commerce or of war, without distinction of flag.

THE SUEZ CANAL

The idea of cutting a canal between the Red Sea and the Mediterranean occurred to some Frenchmen as early as 1846, as they found the crow-fly distance between these two seas to be only seventy-five miles. The excavation was started in 1859 under De Lesseps, a French Engineer, who took full ten years to construct the canal. It was opened in November, 1869. It is 103 miles long with a minimum width of 150 feet and a depth of 33 feet. The canal is at sea level throughout. The Suez canal is not owned by any Government but by a company, the majority of whose shares are in the hands of the U.K.

Territorially the canal belongs to Egypt and when the Company's concessions expire in 1968, the whole undertaking will revert to Egypt.

No single human enterprise during the past century has done more to affect the destinies of nations through a physical geographical change than the piercing of the Isthmus of Suez. Before the opening of the canal, steamers plying between Europe and Asia had to pass round the whole African continent. The canal opened up a new shorter route and effected rapid expansion of trade between these two continents, reducing the distance by 5,000 miles. It must be admitted that importance of the Cape ports declined considerably after the opening of the Suez.

RELATIVE ADVANTAGES OF THE SUEZ CANAL TO EUROPE, ASIA AND AUSTRALIA

From Liverpool to	Bombay	Batavia	Hongkong	Sydney
via Cape	10,730	11,205	13,195	12,626
via Suez	6,189	8,516	9,785	12,235
Distance saved	4,541	2,689	3,410	391

Before the construction of the Panama Canal, the usual trade route between the eastern coast of North America and the Far East was through the Suez. The Suez Canal saved a great deal of distance by diverting the traffic from the Cape of Good Hope route to itself and thus benefited North America greatly.

RELATIVE ADVANTAGES OF THE SUEZ CANAL BETWEEN THE EASTERN COAST OF NORTH AMERICA AND THE FAR EAST

From New York to	Bombay	Batavia	Hongkong
via Cape	11,511	11,986	13,966
via Suez	8,102	10,426	11,676
Distance saved	3,409	1,557	2,293

The canal is of utmost importance to the British Commonwealth for it connects the United Kingdom with the Eastern countries. In order to keep the passage safe through the Mediterranean Sea the British fleet guards the entrance at Gibraltar and the exit at the Suez.

2 The Suez Canal has provided not only the fastest but also the most economical line of transit between Europe and the East. About 6,000 vessels pass through the canal, and nearly two-thirds of the net tonnage is British. Italy, Germany, Holland, France and Japan are next in importance.*

3 The Suez route passes through the heart of the Old World and touches more lands and serves more people than any other route. *"The frequency of ports along this route provides excellent opportunities for trade of the short haul type."* Fuel is available at the two ends of the route—oil in Burma and Indonesia, and coal in Western Europe.

The Suez Canal has got a new traffic rival since the opening of the Panama Canal. A shorter route is now provided by this canal to the U. S. A. to maintain trade relation with Japan, Hongkong and the Philippines. The Panama Canal also shares with the Suez Canal a small portion of the traffic of Europe bound for New Zealand, Australia and Japan.

There are certain drawbacks of the Suez Canal. It is narrow and shallow, and therefore large types of modern vessels cannot pass through it. This defect is being gradually remedied by widening and deepening the canal. It is now possible for ships over 40,000 tons to pass through the canal. The canal has the maximum capacity of handling only 24 ships per day.

Another defect lies in the transit time. Formerly, it took nearly 30 hours to reach one end of the canal from the other.† Now the transit time is much shorter—it is slightly over 12 hours. Enlargements at some place and numerous improvements have been made. Search-lights and lighthouses guard the course.

The most serious drawback, however, is the high canal dues levied on ships which pass through the canal. When speed is not essential, many cargo-liners follow the Cape of Good Hope route to avoid the high dues. Recently the canal dues have been reduced.

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* Details of traffic through the Suez

Year		Tonnage	No. of transits	No. of passengers
1870	...	436,609	486	26,758
1900	...	9,738,152	3,441	282,511
1930	...	31,668,759	5,761	305,202
1937	...	36,491,332	6,635	697,800

—Schonfield, H. J. : The Suez Canal.

† One vessel is tied up to the bank while the other passes through.

According to an International Convention (1886), which is a recognised part of International Law, the Suez Canal is *free and open, in time of war as in time of peace to every vessel of commerce or of war, without distinction of flag.* Territorially, the Canal belongs to Egypt and when the Company's concessions expire in 1968, the whole undertaking will revert to Egypt.

THE PANAMA CANAL. The completion of the Suez Canal gave a great impetus to the proposal for a canal to connect the Atlantic and the Pacific Oceans across the Central American Isthmus. At first two rival routes were proposed—through Panama Isthmus or through Nicaragua. Panama offered great advantages in respect of length and situation. But the work could not be undertaken before 1907 because of political disturbances in the State of Panama. The region through which the Panama Canal has been constructed is hilly and is composed of hard rocks. The difficulties were removed by cutting the rocks and constructing a series of locks.

The Panama Canal was opened on 15th August, 1914. The canal is owned by the Government of the U.S.A. The length of the canal from shore to shore is 40½ miles, and from deep water on the Atlantic side to deep water on the Pacific side, 50 miles. It has a minimum depth of 41 feet. The passage through the canal takes seven to eight hours. The canal can handle 48 ships per day.

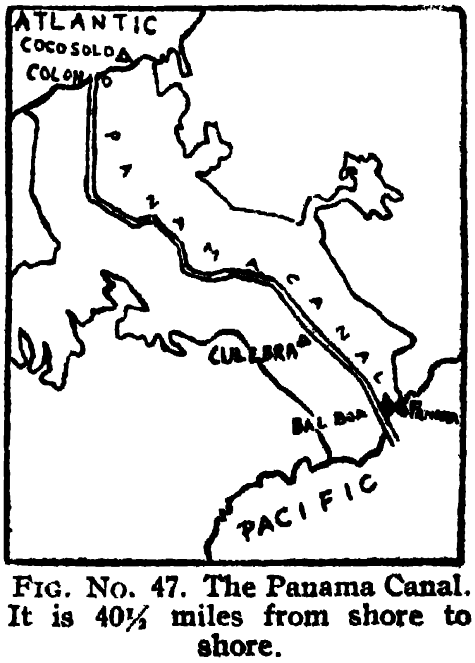

FIG. NO. 47. The Panama Canal. It is 40½ miles from shore to shore.

The canal has given rise to many new routes and to certain alteration in the old ones. Formerly the only sea-route between the eastern and the western coasts of the Americas was by Cape Horn. The canal has brought the Pacific coast of America in close touch with the Atlantic coast of the same Continent. The canal is a political and strategic link that enables the U.S.A. Navy to function on either side of the country at will, should the occasion arise.

THE PANAMA CANAL AND ITS EFFECT ON COMMERCE

(*i*) The distance between the Pacific coast of South America and the Atlantic coast of North America has been greatly reduced.

New York to		Valparaiso
via Magellan	...	... 8,400
via Panama	...	... 4,600

As a result of the opening of the canal, the volume of trade between these two areas has increased considerably.

(*ii*) Australia and New Zealand are nearer to the U.S.A. by this route.

New York to	Wellington (New Zealand)		Sydney (Australia)
via Panama ..	8,500	*via* Panama ..	9,700
via Magellan ..	11,300	*via* Suez ..	13,400

(*iii*) It has opened up a new route for Europe for going to Australia and New Zealand. There is practically no saving in distance in using one route in preference to the other, but steamers usually follow the Suez route.

Liverpool to	Sydney		Wellington
via Panama ..	12,400	*via* Panama ..	11,100
via Suez ..	12,200	*via* Suez ..	12,500

(*iv*) It has brought the ports of Japan nearer to the Atlantic ports of North America.

New York to	Yokohama
via Panama ..	9,700
via Suez ..	13,100

(*v*) The Panama has reduced the distance by sea to a considerable extent between the eastern and the western coasts of North America. There is a saving of more than 7,000 miles. As a matter of fact, before the opening of the Panama Canal there was practically no sea-borne trade between these two coasts.

(*vi*) The western sea board of the Americas has been brought nearer to Europe by more than 5,000 miles.

The Panama Canal is essentially an American Canal. Europe is not benefited by this canal in its trade relation with Asia, Africa and Australia.

The opening of the Panama Canal has, no doubt, made many changes in the ocean routes ; but it must be admitted that its effect on the trade and commerce of the world has not been so great as was brought about by the opening of the Suez Canal. China and Japan have increased their trade relations with the U.S.A. with surprising rapidity after the opening of the Panama Canal.

The route does not suffer for want of fuel. American coal and oil are cheaper than those found on the Suez line.

There are certain disadvantages of the Panama Canal. The canal has six duplicated locks as it has a total rise and fall of 85 feet in crossing the Isthmus. The regions along the route are neither densely populated nor commercially very productive. Moreover, the Pacific Ocean itself is a vast sheet of water with few points of call.

THE KIEL CANAL. The sea route from the Elbe round Jutland to the Baltic is about 600 miles in length and a voyage through this route is a piece of dangerous navigation. The Kiel Canal connects the Baltic with the North Sea at the mouth of the Elbe and makes the voyage only 61 miles long. It was completed in 1895 ; it has a depth of 38 feet and 144 feet bottom width. It is capable of allowing passage to large sea-going vessels.

The canal is of great commercial and strategic value to Germany.

THE MANCHESTER SHIP CANAL. It is the most important canal in the British Isles. It was constructed in 1894 from Eastham, on the left bank of the Mersey to Manchester. The canal is 35½ miles long, the minimum depth is 28 feet, and the minimum bottom width is 120 feet. Since its completion the traffic has grown steadily year by year. Before the construction of the canal Manchester had to depend on Liverpool from where raw cotton used to come by railways. To-day steamships can come as far as Manchester.

Other important ship canals are the Amsterdam Ship Canal, the Stalin Canal, etc. *The Amsterdam Canal* permits Amsterdam to maintain a direct route with the North Sea. The canal was originally constructed in 1876. *The Stalin Canal* has created for Soviet Russia a direct sea-route from the Baltic to the Arctic Ocean. It connects Leningrad with the White Sea.

Air-Transport

Aviation is the latest development in transport. The two World Wars gave a great impetus to the development of aerial transport. There are two types of air vessels—airships and aeroplanes. The airship is lighter than air, while the aeroplane is heavier than air. So far much progress has been made in the use of aeroplanes. In spite of the fact that aviation is the quickest method of transport, it will not be able to compete with railways and ships for the movement of cheap and bulky goods. But aerial transport will be preferred to other modes in moving mails, precious goods and to some extent passengers.

Air-transport is controlled to a great extent by climatic conditions. Heavy rain or snow-storms suspend flying operations temporarily. Ground fogs also make safe landing of aeroplanes difficult. Again, the relief of the land over which flying will take place must be taken into consideration. Level lands are favourable for landing grounds. Commercial flying has, therefore, developed greatly in lowland regions like the U.S.A., Germany, Russia, U.K. and Holland. The routes are usually decided in relation to ground marks such as rivers or cities for the sake of safety and ease of navigation.

In respect of paying load—freight, transport and mail passenger—France is first in Europe and sixth in the world. The other countries in order of importance are England, Holland and Belgium. In Great Britain aerial transport is steadily developing. The British Overseas Air Corporation—a combination of different companies—maintains connections not only with Europe but also with the distant countries of the Commonwealth. A regular service is maintained with India, South Africa and Australia. At present services in connection with civil aviation have been nationalised in Great Britain.

The amount of air-traffic in the United States exceeds the total of all other countries. The three chief air-lines are the United Airlines, American Airlines and Trans-Continental Air-lines, which are linked with those of Canada and South America.

MILEAGE OF REGULAR AIR-ROUTES

(civil aviation)

1938

U. S. A.	71,200
France	41,000
Germany	33,000
U. K.	25,500
India	6,700

In 1949 the world's scheduled airlines carried more than 25,000,000 people. Airline load averaged 70,000 passengers a day and scheduled flight frequencies were such that an aircraft was taking off or landing at one of the airports along the world's network every five seconds of the day or night. In the same period, Trans-Atlantic airliners flew an average of 30 flights a day across the North Atlantic and carried nearly 300,000 passengers.

THE CHIEF AIR-ROUTES OF THE WORLD

1. *Airways between Europe and America.* This route is served by French, American and British aeroplanes. The route follows the Atlantic coast of Africa up to Dakar or Bathurst, and from there it crosses the Atlantic and reaches Pernumbuco in Brazil. Pernumbuco is connected by airways with Santiago in Chile. The U. S. A. airlines meet Pernumbuco along the Atlantic Coast.

2. *Airways between Europe, Asia and Australia* are maintained by the French, Dutch and British aeroplanes. The British air-routes start from London and end in Melbourne *via* Marseilles, Athens, Alexandria, Cairo, Gaza, Bagdad, Bahrein, Sharjah, Karachi, Jodhpur, Delhi, Allahabad, Calcutta, Rangoon, Bangkok, Penang, Singapore, Batavia, Darwin, Brisbane and Sydney.

The Dutch and French airlines follow more or less the British route. Recently Soviet Russia has opened a new line which connects Moscow with Vladivostok on the Pacific.

3. *Airways between Europe and Africa.* The air services between Europe and Africa are controlled by the Italian, French and British aeroplanes. The British own the most important

airways system in Africa. The British route starts from Southampton and goes to Alexandria across the Mediterranean. From Alexandria the route goes straight to Khartoum, from where the journey is diverted to two different directions—one branch goes to the west at Lagos and the other to the south at Cape Town.

The French have established two air-routes to Africa. One follows the western coast of Africa and goes as far as French Equatorial Africa *via* Bathurst. The second route goes across the Sahara and the Congo and ends in Madagascar. The Italian airlines go by way of Tripoli and Cairo to Addis Ababa in Abyssinia.

4. *Airways between America and Asia.* Air-transport across the Pacific is maintained by U.S.A. aeroplanes. The line starts from San Francisco and goes across the Pacific to Canton *via* Honolulu, Midway Island, Wake Island and Manila.

Germany maintains air service with Norway, Sweden and Finland in the north ; with Poland in the east ; with Czechoslovakia, Yugoslavia and Greece in the south-east ; with Italy in the south ; with Spain and Portugal in the south-west ; and France and the U. K. in the west. The French and the Dutch lines competed with the German lines in Western and South-Eastern Europe in peace time.

In the development of airways, the U. S. A. leads the world. There are several trans-continental airlines in the country. The important air-ports are Boston, New York and Washington on the east coast, and Seattle, San Francisco and Los Angeles on the west coast.

QUESTIONS

1. Describe the recent developments in transport facilities that have given impetus to agricultural production of Canada. (Cal. B. Com. 1930).

2. What do you know of the British Air-route in the East? State your opinion about the prospects of Air-Transport in India. (Cal. B. Com. 1927).

3. "The traffic through the Panama Canal has increased with surprising rapidity in recent years." State briefly the factors that have led to the improvement. What are the principal commodities that pass through the canals? What are the main defects of this route to the east and how are these going to be remedied? (Cal. B. Com. 1927).

4. Discuss the present position of mercantile marine in the important maritime countries of the world. What do you know about the recent development of India in this direction? (Cal. B. Com. 1926).

5. "The opening of the Panama Canal has brought about many changes in ocean routes, but by no possibility can it have such an important effect on the commerce of the world and lead to such rapid expansion of trade and traffic as was brought about by the opening of the Suez Canal." Discuss this statement. (Cal. B. Com. 1926).

6. Discuss the importance of the Suez route to India's external trade. How will this trade be affected if the route be temporarily closed? (Cal. B.Com. 1936).

7. Describe the Suez Canal with the object of showing its commercial value. (Cal. B. Com. 1924).

8. Distinguish between a Tramp and a Liner. What are the routes of going from India to the Pacific ports of South America?

9. Discuss the relative advantages and disadvantages of the Suez and Panama routes from Western Europe to Eastern Asia. Large quantities of jute goods are exported from Calcutta to the Pacific ports of South America. What route do the ships follow for this trade and why? (Cal. B. Com. 1934).

10. State the present distribution of the world's merchant marine. How have the relative positions of the countries in regard to merchant marine changed since the last Great War? Who are the principal carriers of India's sea-borne trade? What are "Tramp" steamers, and what commodities do they carry? (Cal. B. Com 1934).

11. Compare and contrast the conditions of inland water transport in England and Germany. (Cal. B. Com. 1933).

12. How does the Cape Route compare with the Mediterranean from India to Europe? In what way will India's trade with Western Europe be affected if the latter route is blockaded during a war? (Cal. B. Com. 1938).

13. Describe the present development of airways in the British Commonwealth. Draw a map of the world and indicate the air routes between Europe and Asia.

14. Discuss the possibilities of opening railway lines between India and Europe.

15. Discuss the past and future effects on commerce and international relations of the construction of the Panama Canal. (I. I. B. 1944).

16. What are the advantages of Air-Transport over other means of transport? Draw a sketch map of the world and indicate the air routes between Europe and Asia. (Delhi U. B.A. Hons. 1950).

17. What are the comparative advantages and disadvantages of water transport over land transport? (I. I. B. 1947).

CHAPTER IX

DEVELOPMENT OF PORTS AND HARBOURS

A port is essentially a gateway to the land from the sea, and also, none-the-less truly, a gateway to the sea from the land. It is a place on the water route where ships can find accommodation during the process of loading and unloading.

The dual operation of loading and unloading cargo involves two important characteristics in a port, without which its function cannot be satisfactorily performed. These characteristics are shelter and accommodation.

It is not easy for a ship to load or unload goods in an exposed and unprotected situation on the sea coast. In British West Africa, where the coastal sea is very shallow, ships are compelled to lie at some distance off the shore. If the sea is violent all the year round, it is equally difficult to perform shipping operations.

Thus, in order to perform loading and unloading with ease and safety, ships require shelters on the coast. It is an important requirement. The idea of shelter is closely associated with the term harbour. A harbour is a place of shelter for ships. There are two kinds of harbours—(*a*) artificial and (*b*) natural. *A natural harbour is generally an indentation in the coast-line, sufficiently enclosed or protected by its environment and topographical features to provide a tranquil water area for shipping.* San Francisco, Liverpool and Cork possess excellent natural harbours.

Artificial harbours are constructed in places where environment and topographical features are unfavourable. *Breakwaters and dredges* are always used. The object of breakwater is to break up and disperse waves for preventing agitation of the water surface within the harbour area so that ships can lie in safety. Where the water is shallow, dredges keep the outlet deep. Los Angeles and Madras have artificial harbours.

An ideal harbour should be (*i*) well-protected against storms, (*ii*) free from ice during winter, (*iii*) deep enough for vessels, with fairly deep water near the shore, (*iv*) wide enough to give room for large ships to turn in, (*v*) sufficiently spacious for docks and wharves, and (*vi*) accessible to the interior by straight and level routes.

The next important requisite of a port is accommodation. Accommodation means facilities and opportunities for carrying on trading operations. A harbour by itself does not suffice for all the requirements of a port, which must include convenient and continuous accessibility and facilities for the landing and loading of goods, the embarkation and disembarkation of passengers, quays, sheds, warehouses, cranes, service roads and railway tracks and repairing depots.

Ports grow and prosper because they are important gateways of trade. Trade is attracted when a port enjoys economic advantages like (*a*) a large productive and consuming hinterland, (*b*) easy access to the hinterland and (*c*) location on or near main world trade routes. *The fundamental importance of a port, however, consists in the extent and productiveness of its hinterland.* The term hinterland is borrowed from Germany. It means a region to which a port acts as a 'door'. The trading operations of the port of Calcutta are performed for Bengal and Bihar ; and, therefore, we may say that the hinterland of Calcutta includes these two provinces. The resources of a hinterland should be bountiful, if the port is to develop greatly. A dense population, rich economic products and a good transport system make a hinterland productive. In short, a hinterland should possess inducements for trade. The extent of the hinterland of a port depends on the nature of the means of communication. Communications bring the different parts of the hinterland in close touch with the port. A port is a connecting link between land and water traffic ; and, therefore, it must be connected with the surrounding areas by roads, railways, rivers and canals. Hinterlands are generally of two types —distributory and contributory. A *distributory hinterland* imports goods either to feed the dense population, or to supply the inhabitants with the necessaries and luxuries of life. Goods are also imported as raw materials for manufacturing industries. The hinterland is *contributory* when the goods are exported. These goods may be food or raw materials or manufactured articles. The trade of a port reflects the conditions of production, consumption and transport facilities of its hinterland.

There may be several ports in the same hinterland. Traffic will flow to those ports which will offer greater trading facilities. Bombay, Okha, Porbandar and Navalakhi on the western coast of India compete with one another. The ports of Kathiawar are getting more traffic because of lower port charges than those of Bombay.

Ocean ports, river ports, canal ports and estuary ports are so named because of their locations. These ports have different functions to perform ; each of them owes a large share of its industrial development to the ease of obtaining raw materials and the existence of assured markets.

OCEAN PORTS may be divided into four classes according to the character of the harbours and their relation to the routes on the lands:

(1) Open roadsteads, *e.g.*, Boulogne: These are usually poor, because they do not afford good and safe harbours with sufficient depth, and protection from winds and waves. They are rarely located near the mouth of large valleys, and therefore, transportation towards the interior is hampered.

(2) Bay ports, *e.g.*, Boston. Harbours at such places may be safe, commodious and deeper, and there may be plenty of room for docks.

(3) River ports like Calcutta and Chittagong have the advantage of easy communication inland, but they often suffer from lack of depth and space for anchorage, docks and wharves. Room can only be found by extensive digging or by going far up or down the river.

(4) Ports with both a bay and a river are commercially most advantageous. They usually combine safe and commodious anchorage with sufficient room for docks and wharves, and with easy access to the interior.

RIVER PORTS—All navigable rivers have towns situated on their banks, where the products of the immediate neighbourhood are collected and transported up and down the rivers. The importance of these ports depends upon the navigability of the rivers, the suitability of their situation on the river banks, and also upon the productivity of the neighbouring districts.

For a study of ports a fair knowledge of entrêpots is necessary. *Entrêpots** *are ports which import commodities for*

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* Entrepots are ports for other ports.

the purpose of re-export to other ports. In short, these ports act as middlemen and their main function is redistribution. These ports collect goods not for the local areas but for certain regions which cannot import directly from the sources. Singapore, a port at the end of the Malaya Peninsula, receives the products of the adjoining islands for exporting them to the different parts of the world.

The commodities which are handled by the entrepots must possess certain characteristics. "The goods must have high value, small bulk and good keeping quality."

Distance between the place of origin and destination of goods also influences the entrepot trade. The hold on the trade of the entrepots is great when the origin and destinations of the traffic are remote. Spices, drugs, silks, and other tropical products are consumed in small quantities by the European countries. It is a great economy when these commodities are distributed from some western entrepot. Humburg, on the Elbe, is the entrepot for Norway, Sweden and the Baltic States. An excellent example of an entrepot is afforded by Port Said, where all the routes from the West meet before passing the Suez. The great entrepots of the world are London, Colombo, Singapore, Hamburg and Shanghai.

Standards of comparison. The standards by which the importance and prosperity of ports can be measured are various, and hence are not simple and easy. The following are usually employed :

1. The number of ships visiting a port during a year.
2. The tonnage of shipping.
3. The tonnage of goods discharged or handled in and out.
4. The marketable value of the produce dealt with.

The importance of a port cannot be measured simply by the number of ships visiting it every year, because the ships may be very small or big in size. The size and importance of the vessels can be ascertained to a certain extent from the tonnage of shipping. In addition to this, the tonnage of goods handled by a port can also be a very good standard of comparison. But it has one great drawback : it makes no distinction in the nature of goods, whether valuable or merely bulky and cheap.

SOME IMPORTANT PORTS

EUROPE. The important sea-ports of Europe are situated on the north-west coast. The chief of these are Hamburg at the mouth of the Elbe ; Rotterdam on the Rhine ; Antwerp on the Scheldt and Havre on the Seine. The hinterlands of these ports are very extensive and productive.

The hinterlands of the Mediterranean ports have become important after the opening of the Suez Canal, which has made the Mediterranean Sea one of the most important highways of commerce. The chief sea-ports are Marseilles, Genoa, Naples and Trieste. The Baltic and the Black Seas are almost land-locked and, therefore, have no important ports, although Constantinople and Copenhagen occupy very favourable positions.

London is situated at the head of the Thames estuary 55 miles from the sea. Dredging operations are not generally necessary, as the tide rises from 16 to 21 feet at London Bridge. 'London has for a long time played the role of an immense international warehouse. It receives products from all over the world, which it immediately re-exports.'' From an entrepot, it has become the greatest money centre in the world. The principal commodities imported are wool, grain, timber, refrigerated meat, tea, coffee, sugar, dairy produce, wines, spirits, tobacco, rubber, fruits, carpets, etc.

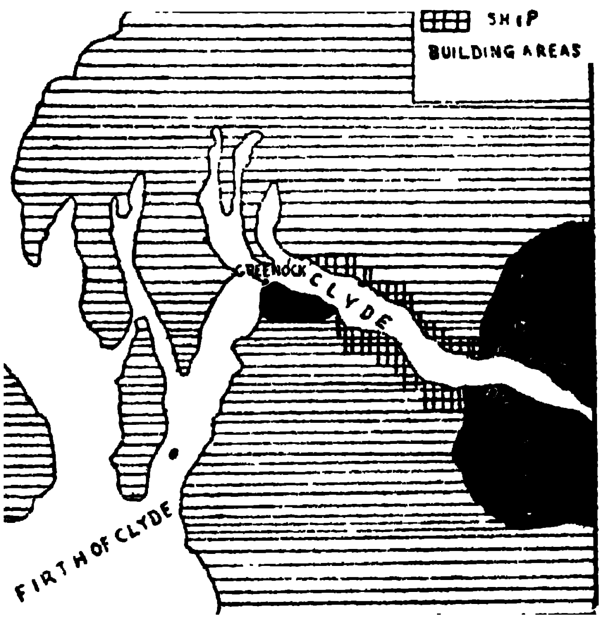

FIG. No. 48. The harbour and port of Glasgow.

Trade and industial activities of London are also great. There are paper mills, chemical plants and factories for rayon. Clothing, furniture, jewellery, hats, etc., are also made.

London is the most important port of the British Isles. It receives between 30 to 40 p.c. of British imports and despatches more than 25 p.c. of the country's exports.

Glasgow is the largest ship-building centre in the world. The port is situated on the Clyde, 20 miles east of Greenock. The Clyde banks from Greenock to Glasgow are noted as ship-building regions with many docks. The sheltered position of the Clyde, the supplies of iron-ore and coal in the neighbourhood, the depth of the river—these have made the Clyde estuary an ideal ship-building area.

Although Glasgow is an engineering centre, it has developed other industries as well. Woollen goods, the manufacture of carpets, dye works, glass works, chemical works, oil refineries, paper mills, soap works, the making of confectionery, etc., are there not only to meet the needs of its great population but also for markets abroad.

Liverpool is situated at the mouth of the Mersey estuary. It competes with London for the premier position. It is the leading port for the importation of raw cotton, grain and provisions. Woollen and steel goods, pottery, chemicals, hardware, etc., are exported. The hinterland of Liverpool not only covers South Lancashire, but also Yorkshire, Staffordshire and Cheshire.

The port of Liverpool handles more than one-third of the passenger traffic of Great Britain. Flour-milling, sugar-refining, chemical, soap-making, etc., are the principal industries. Liverpool is also an airport.

Cardiff is the leading port for the shipment of coal, not only in Great Britain but also in the world. It is not only a coaling port ; it also deals in timber, grain and iron-ore. The densely populated area in the vicinity of the port requires a steady influx of food-stuffs. There are also important iron and steel works in the port area. The prosperity of Cardiff has been threatened recently by the falling off in the demand for coal from abroad, due to various reasons. Oil is now largely used for ship and locomotive engines. Moreover, several countries have developed hydro-electric power. These factors have affected adversely the coal-export trade of Cardiff.

Manchester is situated on the river Irwell, a tributary of the Mersey. It is connected by a ship canal with Liverpool.

It is the fifth port in Great Britain. Its central position has made it a collecting centre of raw cotton for despatch to various towns. It is interesting to note that about 90 per cent. of Lancashire's spindles are confined within 17 miles of Manchester.

Hamburg, the most important port of Germany and one of the principal ports of the Continent, is situated on the Elbe at a distance of nearly seventy miles from the open sea. The estuary of the Elbe has been dredged to a sufficient depth. As the port is connected with the plains of Germany by waterways and railroads, the commerce of the country converges towards it. Hamburg is a great entrepot or warehouse port. It imports coffee, cocoa, sugar, coal, cotton, wool and manufactured goods not only for Germany but also for Scandinavia and the Baltic States. Exports include manufactured goods, salt, sugar, cattle and dairy products. The port competes for traffic with Rotterdam and Antwerp.

Now that the construction of the Ems-Weser and Hansa canals has been completed, Hamburg has got direct water communication with the industrial Ruhr Valley. Much of the trade which used to pass through Rotterdam and Antwerp is now handled by Hamburg. Cuxhaven is the outport of Hamburg.

Rotterdam is situated on the New Mass, a distributory of the Rhine, and is connected with the sea by a deep canal known as the New Waterway. It is a great transhipment port at which goods are transferred from ocean-going vessels to river crafts for transmission by the channels of the Rhine, and by inland waterways, to the great manufacturing districts of Westphalia and the inland cities of Germany, Holland and Belgium. Although Rotterdam is the natural gateway of the Rhine, Germany has taken elaborate measures to divert the Ruhr traffic to Hamburg through the Hansa canal.

Antwerp, in Belgium, is situated at the mouth of the river Scheldt. It is one of the greatest ports in the world. It has a large entrepot trade. Its hinterland includes Belgium, Eastern France, the Rhine Valley and the Ruhr coal-field. The traffic of Antwerp mainly deals with liners and general cargo. The port competes with Rotterdam and Hamburg. In 1947, Antwerp ranked first amongst the sea-ports of the European continent.

Marseilles is the first port and second city of France. It is situated some 30 miles east of the Rhone mouth. Its position at the head of the Gulf of Lyons and at the entrance of the Rhone Corridor has made it very important. It has been greatly benefited by the opening of the Suez Canal. By a deep-water canal it has recently been connected with the Rhone. It has not only made the trade with the East very convenient, but has also got direct access to the French North African Colonies. Wheat, oil-seeds, sugar, coffee, hides, silk, spices and other Eastern products are imported. Among its local industries may be mentioned particularly the refining of oil and the making of soap.

NORTH AMERICA. The important ports of North America are Montreal, New York, Boston, Halifax, New Orleans, Mobile and Galveston on the Atlantic and San Francisco, Oakland, Seattle, Vancouver and Portland on the Pacific. The hinterlands of the Atlantic ports are very extensive and rich in economic resources while those of the Pacific ports are poor.

Baltimore, on Chesapeake Bay, is a great port and distributing centre. It is connected with the Middle Appalachian Region by cheap water transport. Tobacco, iron and steel goods and artificial fertilizers are manufactured in addition to fruit-canning. It is the biggest city in South-East U.S.A. and contains more than 800,000 people.

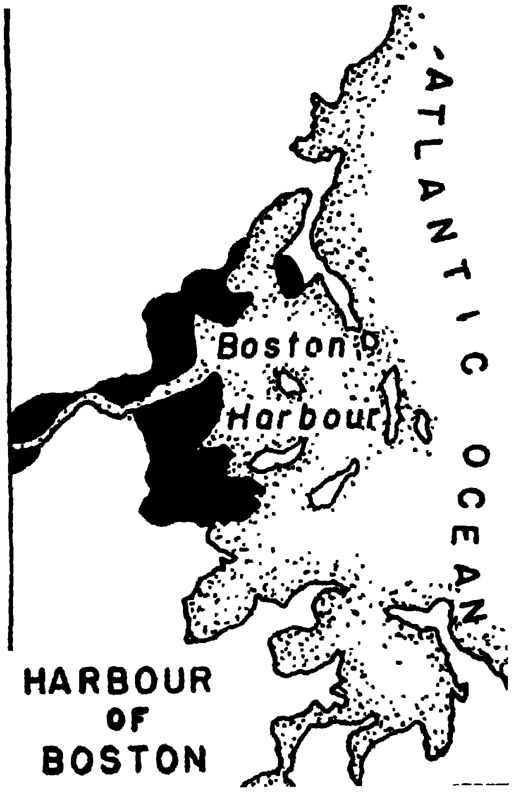

FIG. No. 49. Boston harbour is a sheltered bay.

Boston is the commercial gateway to the great industrial district of New England. Boston harbour is a sheltered bay which is 9 miles by 16 miles in area ; it is well situated with regard to Atlantic routes ; and it is served by railways which reach Portland, New Brunswick, Montreal, New York, etc.

Though Boston is next to New York in importance, yet its main wealth today is derived from manufactures rather than commerce. It is the nearest port to Europe which has a dense population and a rich hinterland. The port is open all the year round. It has also a big coasting trade. Hides, skins, cotton, wool, etc., are imported for the neighbouring districts. Sugar, textiles, paper, leather and iron and steel are manufactured.

Montreal, situated at the confluence of the Ottawa and the St. Lawrence, lies at the limit of ocean navigation. It is the most important port of Canada. It is 300 miles nearer to Liverpool than New York. Its harbour, in extent and equipment, is one of the finest in the world, but its great drawback is that the navigation is closed by ice during the winter months. Montreal is the largest city of Canada and contains more than 800,000 people.

New Orleans, situated at the mouth of the Mississippi at a distance of 10 miles from the Gulf of Mexico, is the largest city of the Cotton-Belt of the U.S.A. Its hinterland includes the rich Mississippi-Missouri basin. Originally New Orleans was important as an outlet for the fur trade. To-day, it is a great cotton port, and exports cotton, refined petroleum and wheat to North-West Europe in large quantities. Cattle, timber and maize are also exported. *New Orleans is not so well situated as Boston or New York for trade with Europe.*

New York is the greatest commercial gateway to America. Nearly one-half of the total foreign trade of U.S.A. passes through it, and as such, it is supreme in America. It has the heaviest coastwise traffic. It actually handles more wheat, coal and timber than any other port of America, possessing, as it does, special large-scale facilities for handling heavy goods.

Advantages of New York : (*a*) It has easy access to a large and rich hinterland by canals and railroads. (*b*) It has an excellent harbour.

SHARE OF PORTS IN THE FOREIGN TRADE OF THE U.S.A.

Imports into U.S.A.		*Exports from U.S.A.*	
New York	34 p.c.	New York	34 p.c.
Galveston	13 ,,	Boston	6 ,,
New Orleans	7 ,,	Philadelphia	9 ,,
San Francisco	5 ,,	New Orleans	6 ,,

The important Pacific ports of North America are San Francisco, Los Angeles, Seattle, Portland and Vancouver. These ports have large harbours with good shipping facilities. But these ports have certain drawbacks: (*a*) their hinterlands are small and sparsely populated; (*b*) the Pacific coastal region is industrially less developed; (*c*) long distances and difficult routes separate these ports from the Continental interior.

San Francisco is the most important port on the Pacific coast. It is on the hilly peninsula to the south of the Golden Gate and is connected with Oakland by train ferries. It handles lumber, grain, oil and fruits. Tea, silk and sugar are imported from the Far East.

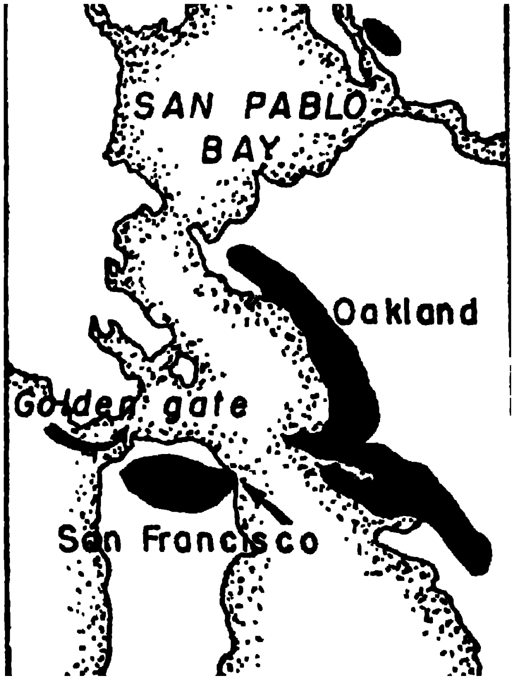

FIG. No. 50. San Francisco has an excellent natural harbour. The Golden Gate is the entrance to the port. The urban areas are painted black.

SOUTH AMERICA. Although the size of South America is twice that of Europe, its ports are few. The Atlantic ports command greater traffic because of the great extent of their hinterlands. The *Andes* are set close to the Pacific coast, and there the Pacific ports have limited resources. The principal ports of South America are Rio-de-Janeiro, Buenos Aires, Valparaiso, Montevideo, Bahia, Guayaquil and Bahia Blanca.

Rio-de-Janeiro is the capital of Brazil ; it is also the chief sea-port. The harbour is commodious and safe. The hinterland is extensive, and it includes Sao Paulo, Mines Geraes, Panama and Travessia. The railways connect Rio-de-Janeiro with Sao Paulo, Uberaba, Sta. Maria, Bello, Horizonte and Victoria.

Buenos Aires is the capital of Argentina and stands on the river Plata. It is also the chief sea-port. The Rio de la Plata is both a river and an estuary, as it fulfils some of the conditions of each. According to international law, it is a river and is the world's widest—137 miles. The river is generally shallow, and therefore, constant dredging operations are carried on. Recently dock accommodations have been improved. Buenos Aires is the chief outlet for the produce of the agricultural and pastoral districts of the Republic. Wheat, maize and linseed are exported in large quantities. It is also a great railway centre.

Valparaiso is the most important port on the Pacific coast of South America. It is situated on a fine bay and its position is similar to that of San Francisco. Its hinterland includes the rich mineral districts of Chile. Nitrate of soda, copper, silver and gold are exported. The port is connected with Buenos Aires by railways. A new port has been developed at St. Antonio, 43 miles to the south of Valparaiso.

Montevideo is the capital of Uruguay ; it is also an important port. It possesses a large harbour, but the water of the shore is very shallow because of the accumulations of silt. Large ships have to anchor two or three miles away from the shore, from where goods are carried to the port by lighters.

Guayaquil is the chief port of Ecuador. It has an excellent harbour at the estuary of the river. The main drawback is the unhealthy climate of the port. Ivory-nuts and coffee are exported.

ASIA. *Karachi* is the chief port of Pakistan, situated nearer the mouth of the Indus in Lat. 20°47′N, Long. 60°58′ East. Karachi is not yet an industrial centre ; it is of importance as the principal market and port of shipment for the surplus produce of West Pakistan. Wheat, cotton, barley, rice, gram, oil-seeds, wool, hides and skins and animal bones are the principal exports. The imports include woollen piece-goods, sugar, machinery, iron and steel, mineral oils, coal and coke.

Bombay owes its importance to its excellent geographical location and to its magnificent natural harbour. It is situated on an island in Bombay State in Lt. 18°55′ N., Long. 72°54′ E. The average temperature ranges between 75°F in January and 85°F in May. The average rainfall of the port is 75″.

The harbour is safe and spacious and covers some 74 square miles. It affords ample shelter to shipping throughout the year. "The entrance to the harbour is from the South-West; and the Colaba peninsula, the narrow strip of land which constitutes the southern extremity of Bombay Island, forms a natural breakwater affording protection from the violence of the monsoon."

The hinterland includes the whole of the Deccan and the central part of India and extends to East Punjab. The port is connected with Northern India by the Western Railway and with the Deccan, by the Central Railway.

Cotton is the most important commodity which is brought down to the port from the Deccan and Central India for export. Hides, grain, seeds and manganese ore are also exported. The chief imports are machinery, oil, sugar, timber, meat, etc.

It is interesting to note that while Calcutta is served by a magnificent waterway-system, no navigable river connects Bombay with the interior.

Cochin is the most important port between Bombay and Colombo. It is nearly 300 miles nearer to Aden than Bombay.

"The system of backwaters running parallel with the coast affords cheap transport and excellent waterways connecting several places of importance in the Cochin and Travancore States and when the natural situation of the port has been fully developed, its position should ensure a very great increase in its trade."

Madras is the chief port of Madras State. Till the construction of an artificial harbour Madras was an open roadstead with a surf-beaten coast-line. The harbour is connected with the different parts of the Deccan and Northern India by railways. The chief imports are coal, oil, manures, paper, timber, sugar, metal, glass and glassware, chemicals, machinery, motor vehicles, etc. The chief exports include groundnuts, tobacco, ores, manures, coffee, onions, etc.

Calcutta is situated in Lat. 22°33′ N, Long. 38°21′ E on the river Hooghly. It is a great sea-port, although it is 120 miles from the sea. Its hinterland includes Bengal, Bihar, U. P., Assam and Orissa, and also extends to East Punjab and the northern part of the Deccan. The port serves the great coal, tea and jute industries of Bengal and Assam and the wheat, rice and seeds traffic of Bihar, U. P. and M. P. It imports cotton piece-goods, metals and ores, oil, machinery, hardware, paper, motor vehicles, liquors, etc. The exports are jute, tea, rice, pulses, hides, lac, pig iron, mica, manganese, etc.

The port facilities are excellent. But the river Hooghly is a difficult river to navigate. Sand banks and bars frequently make the navigation dangerous specially within 40 miles of Calcutta. Dredging operations are constantly required.

Akyab is the only sea-port on the western coast of Burma. It has a sheltered bay, but as a port it is not very important. Its hinterland is neither extensive nor very productive. Besides, the port has no railway communications with the interior.

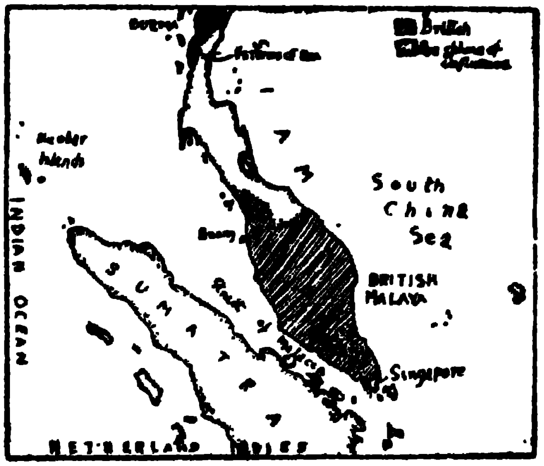

FIG. No. 51. Singapore.

Rangoon is the chief port of Burma. It is situated on the Rangoon river, about 24 miles from the sea. Timber is the most important commodity exported from here. Rice and petroleum are also exported.

Signapore is situated on the southern side of the island of Singapore in the Straits Settlement. The island of Singapore is about 27 miles long and 14 miles wide, and is separated from Sumatra by the Strait of Malacca. The population of Singapore is nearly 50,000. It is the chief entrepot for the whole of the Malaya Archipelago. It exports rubber, tin, copper, pineapples, etc. Imports include petroleum, tobacco, sugar, iron and steel, machinery, etc.

Hongkong is situated at the mouth of the Canton river and consists of an island. The Canton river, which is navigable for more than 600 miles, brings down the produce of China in river steamcraft to Hongkong for transhipment. It is equally important as an entrepot port. Its principal trade is in rice, which is sold for distribution inland and for re-exportation abroad. After rice come sugar, cotton, tea, coal, flour, oil and opium. The harbour of Hongkong is extensive and spacious ; its only drawback is that it is exposed to the influx of heavy seas from the west during the prevalence of typhoons.

Growth of Trade Centres

Trade centres are places where trade is carried on, and goods are collected, distributed or transferred from one means of conveyance to another.

Towns and trade centres do not spring up of their own accord, nor are they just haphazard collections of houses and other buildings. Their origin and growth are the direct consequences of the division of labour, the outcome of the operations of geographical control and the result of man's environment. "A city is not only a place in space ; it is also a drama in time."

In early days, when the volume of commerce was very much smaller than what it is today, the interchange of commodities used to take place between individuals at the common meeting place. The growth of trade centres originated from the necessity of such a common meeting place. Before the commodities are interchanged, they are transported to the trade centre. Hence easy transport facility is the most essential condition for the growth of trade centres. The means of transport should also be cheap.

Conditions favouring the growth of cities:

1. Religion and religious foundations had great town-creating powers. The rise and growth of many religious centres are associated with religion and pilgrimage. These towns are either in the habitable plains or on mountains or deserts to get away from the rest of the world. Rome, Banaras, Mathura, Hardwar have also become important trading centres because of the ease of communications. Places like Lasha (Tibet), Amarnath (Punjab) and Badrinath (U. P.) could not expand because of difficulty of communications.

2. Many towns and cities have grown up as health, tourist and pleasure resorts to give relief to the distress caused by the smoky manufacturing centres, *e.g.*, Madhupur, Bath, the Riviera towns, etc.

The sea-coasts of many countries have assumed great importance to many people as vacation resorts. The sea-coast is cool and pleasant, particularly during summer, and thousands of people go there in that season.

3. Natural wealth, especially useful metals and minerals, always attract people to the mining districts and contribute to the rise and growth of new towns. For example, we may refer to the growth of many towns in the vicinity of Bengal coal-fields. Even when climate and other conditions are remarkably unfavourable, wealth in the concentrated form of precious metals and minerals brings masses of men together, as we find in the case of the hot desert of Australia.

4. Towns tend to grow at the confluence of two regions producing different commodities, because they give the population of the two places a meeting ground for the mutual exchange of their goods. Milan, situated at the foot of the Alps, is a good example in point: here products of the plain and of the mountains are exchanged.

5. Water-power and its conversion into electricity have caused and aided the growth of the "Fall towns" like Richmond, St. Paul, Buffalo and Minneapolis in the U.S.A.

6. Towns grow at places which are most convenient for the receipt of goods in bulk and for their distribution. The world's great cities are generally ports and railway centres.

7. Historical and political movements often influence the development of capital cities more than the physical conditions under which they have been established. Delhi, Washington and Paris are examples.

8. The origin and growth of many towns are due to the commercial and strategic advantages of their position, *e.g.*, Peshawar and Istanbul.

9. In recent years many cities and towns have sprung up owing to their importance as educational centres. Oxford, Cambridge, etc., are examples.

10. Towns grow at the crossing of important trade routes by land or water. Colombo and Singapore have developed because of their location.

11. Fortress cities, garrison towns and naval bases are created because of defence purposes.

There are over 600 cities in the world with a population of 100,000 in each. More than 40 p.c. of these towns are in Europe. In urbanization Australia leads with 44 p.c. of its people in cities, followed by the U.S.A. with 29 per cent, Europe 19 per cent, South America 11 per cent, Asia 5 per cent and Africa 2·5 per cent.

QUESTIONS

1. State the necessary conditions for the development of good sea-ports. Apply these considerations to any of the following:—(*a*) Montreal, (*b*) Freemantle, (*c*) Shanghai, (*d*) Buenos Aires, (*e*) Trieste. (Cal. Inter. 1925, 26).

2. Describe the position of any four of the following ports and discuss the parts they play in the commerce and industry of the country they serve: (*a*) Rotterdam, (*b*) Yokohama, (*c*) Genoa, (*d*) Galveston, (*e*) Buenos Aires. (Cal. Inter. 1928).

3. What factors make for the successful development of a river port? Give a few conspicuous examples. (Cal. Inter. 1934; I.I.B. 1944).

4. What do you understand by the hinterland of a port? Illustrate your answer with reference to a few ports in the different parts of the world. (Cal. Inter. 1934).

5. Account for the importance of any four of the following:—(*a*) Harbin, (*b*) Warsaw, (*c*) Colombo, (*d*) Minneapolis, (*e*) Chicago and (*f*) Manchester. (Cal. Inter. 1933).

6. State the situation and describe the reasons for the importance of any five of the following: (*a*) Buenos Aires, (*b*) Chicago, (*c*) Danzig, (*d*) Durham, (*e*) Hobart, (*f*) San Francisco, (*g*) Sydney, (*h*) Vancouver and (*i*) Yokohama. (Cal. Inter. 1931).

7. State the situation and describe the reasons for the importance of any five of the following: (*a*) Alexandria, (*b*) Durban, (*c*) Marseilles, (*d*) New Orleans, (*e*) Shanghai, (*f*) Sydney and (*g*) Vancouver. (Cal. Inter. 1933).

8. State the situation and mention the geographical circumstances giving importance to any five of the following: (*a*) Glasgow, (*b*) Winnipeg, (*c*) Danzig, (*d*) Mosul, (*e*) Singapore, (*f*) Hongkong, (*g*) Durban, (*h*) Los Angeles, (*i*) Buenos Aires, (*j*) Brisbane. (Cal. Inter. 1926).

9. What are the most important geographical conditions favouring the growth of commercial towns?

10. "The importance of a port depends mainly upon the extent and the productiveness of its hinterland." Discuss the statement.
(Cal. Inter. 1940; I. P. S. 1930; Delhi U. Prep. 1950).

11. What are the important factors in the origin and development of sea-ports? Illustrate your answer with reference to Indian ports.
(I. I. B. 1940).

12. Write notes on any five of the following: (*a*) Rotterdam, (*b*) Yokohama, (*c*) Marseilles, (*d*) Seattle, (*e*) Liverpool, (*f*) Hamburg, (*g*) Sydney and (*h*) New York. (Cal. Inter. 1949).

13. "The character of a harbour has a great influence on the growth of a sea-port, but an ideal harbour does not necessarily give rise to a great port." Discuss. . (I. I. B. 1947).

CHAPTER X

EUROPE

Europe is a very small continent : as a matter of fact, with the exception of Australia, it is the smallest of the continents. It has a total area of 3,760,000 square miles. Asia is five times as large as Europe. Physically, Europe is a mere peninsula of the vast continent of Asia.

Europe is the most highly civilised region in the world. Its manufacture and commerce have reached the greatest development yet known. Certain geographical factors have mainly contributed to its greatness.

The location of Europe has contributed to a great extent towards the industrial and commercial greatness of the continent. The continent is accessible to other continents and to the oceans. It is separated from Africa by the narrow straight at Gibraltar and from Asia by the straights of Dardenelles and Bosphorus. "The two great continents have served as an outlet for European energy by providing territory for colonial expansion, a market for European products and a source of raw materials and food." Even with regard to America, the continent is admirably located for commerce.

Europe has longer sea-coast than any continent in proportion to its area. The Baltic, the Mediterranean and the Black Sea have deeply penetrated into the continent and thereby made ocean-transport the most economical form of bulk conveyance. The situation of Europe in higher latitudes has made the climate neither very hot nor very cold. With the exception of the Tundra and Taiga, every part of Europe is habitable. The climate helps the rapid progress of its people.

More than 31 per cent of the total area of Europe is forested. The principal forest-belt stretches from Scandinavia to the Urals. The forest resources of this belt are best exploited in Sweden, Finland and U.S.S.R. The second important belt extends from the highlands of Southern Germany to Yugoslavia. Europe does not export timber in considerable quantities, because the local demand for it is always great.

Nearly one-half of the mineral wealth of the world is raised in Europe. Coal-fields are found in Great Britain, France, Belgium, South Holland, Germany, Southern Russia and North Spain. The ancient crystalline rocks of Norway, Sweden and Finland and the much disturbed rocks of the Mediterranean basin contain practically no coal. Europe produces about 50 per cent. of the world's coal. Most of the coal of Europe is of anthracite or good bituminous type. As the coal-fields are mostly located near the seaside or the river-valleys, the cost of transportation is not high.

PRODUTION OF COAL*

(Millions of metric tons)

	1937	1951
Europe (excluding U.S.S.R.)	653·8	684·5
Canada and U.S.A.	462·6	536·5
Africa	17·1	30·3
Asia	115·7	122·0
Latin America	4·5	6·5
Middle East	2·4	5·1
U.S.S.R.	128	284

Europe is also the leading producer of iron-ore. The important iron-ore regions are in North Spain, Eastern France, Northern and Southern Sweden, and in Russia (Krivoi Rog, Kursk and Magnitogorsk). There are large petroleum-deposits in the Caucasus, the Urals and Rumania. Europe raises 13·7 per cent. oil of the world's total. Lead, zinc, platinum, copper, potash and aluminium ore are also found in large quantities. But deficiency of minerals in Europe is noticeable with regard to petroleum, lead (17 p.c.), tin and manganese. This is a serious disadvantage in view of the fact that Europe consumes each of these minerals to the extent of 50 per cent. of the world's total. It should be noted, however, that the absence or lack of petroleum in Europe has little relation to the growth of industry since it is nowhere in the world a major source of energy for manufacturing industries. Petroleum is important from the standpoint of transportation and war needs. Europe also produces small quantities of silver, gold, nickel and tin.

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* Source : *U.N.O. Economic Survey of Europe*, 1951.

The agricultural lands of Europe are its greatest resources. It exceeds all other continents in the production of wheat, oats, barley, rye and flax.

	World production	European production
	(in millions of quintals, for the year 1935)	
Wheat ..	.. 1,319	640
Barley ..	.. 426	233
Oats ..	.. 687	415
Rye ..	.. 492	470
Potatoes ..	.. 2,018	1,848
Sugar beet	.. 781	689
Flax ..	.. 6	6

The Mediterranean region, the lowlands of North-Western and Central Europe and the eastern lowlands are the agricultural regions. Farming is highly intensive and the methods of cultivation are scientific. Yields per acre are also high. Nearly 56 per cent. of all the inhabitants of Europe earn their living by farming. Therefore, the continent may be described as rural. Europe produces, normally, about 50 per cent. of the world's wheat. Wheat is cultivated in a wide belt extending from the Danube basin to the southern Urals. The continent produces, on the average, 62 per cent. oats and 95 per cent. rye of the world's supply. In the production of potatoes, sugar beet and barley she surpasses all other continents combined. In spite of the tremendous progress in the agricultural production, Europe imports food and agricultural raw materials from all parts of the world because of the dense population and high standard of living.

Europe is the greatest manufacturing region of the world. The conditions for the development of manufacturing industries were present as early as the 18th century and as a result, the industrial revolution came first in Europe. The conditions were that the large population had a high standard of living to provide potential market ; that the people had a high degree of technical skill which they acquired from their experience in household industries ; that the people had inventive capacities which led them to the use of machines and mechanical power ; and that the continent has had large reserves of coal. Today, the heavy and basic industries of Europe are confined to the coal-fields. The industrial areas of Europe, however, are not uniformly distributed. The major areas are in a continuous belt that extends east and west through the middle portion of the continent and includes Great Britain, Northern France, Belgium, Western and Central Germany, Czechoslovakia, Southern Poland and Central Russia. In the manufacture of chemicals, cement, textile fibres and iron goods, Europe's position is incontestable. She is surpassed only by the U.S.A. in the production of automobiles, electrical equipment and metal wares.

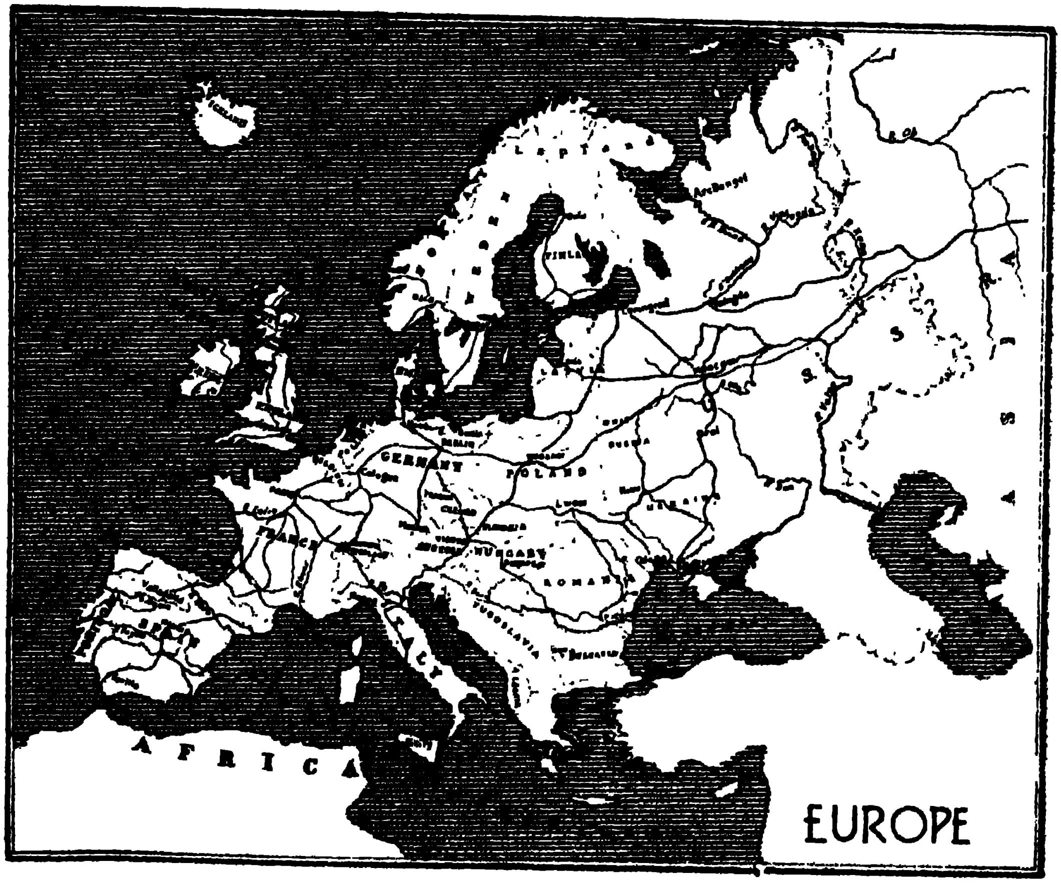

FIG. No. 52.

She has developed her means of communication and transport remarkably. The merchant marine of Europe represents more than 70 per cent. of the world's tonnage. It is interesting to note that while the merchant tonnage of Great Britain is decreasing, that of Norway, Italy, France and Holland is increasing rapidly.

Europe has more than 2,30,400 miles of railways. It makes approximately 4·8 miles per 10,000 inhabitants, and 2·3 miles of railroads for 40 sq. miles. India has a little over 40,000 miles of railway lines (8,000 inhabitants per mile of line) and 100 sq. miles per 2 miles of railway lines. But Europe does not possess the largest railway mileage. U.S.A. and Canada have more than 270,200 miles of railways. In airways, the supremacy belongs to Europe. It maintains regular air service with Asia, Africa and Australia.

Europe accounts for 52 per cent. of total world trade in normal times and this trade is concentrated in the hands of only 19 per cent of the world's population and takes place over only 4 per cent. of the world's area.

PERCENTAGE DISTRIBUTION OF FOREIGN TRADE,
POPULATION AND AREA OF THE WORLD (1939)

Region	Trade p.c.	Population p.c.	Area p.c.
Europe (excluding U.S.S.R.)	52	19	4
Asia (excluding U.S.S.R.) ...	14	53	20
North America	15	7	15
Latin America	9	5·5	16
Africa	6	7	23
Australia	3	0·5	6
U.S.S.R.	1	8	16

Europe has a little over 500 millions of peoples. This figure represents more than one-fourth of the total population of the globe. The distribution of population is very uneven. The mountain regions of Iceland, the highlands of Scotland, the largest Scandinavian mountains, the Norrland of Sweden, the north-eastern part of Finland, the boreal forest and Tundra along the shores of Arctic Ocean are almost uninhabited. Heavy densities with more than 260 people per square mile are found in the Ukraine, Moravia, Silesia, Bohemia, Saxony, Westphalia, the Rhineland, Southern Holland, Belgium, North France and England.

About 20 per cent. of the population of Europe (except Russia and Turkey) live in cities.

Union of Soviet Socialist Republics

The vast territory of the U.S.S.R. (Russia) extends for about 6,000 miles from the Baltic to the Pacific Ocean. It occupies the whole of the great plain of Eastern Europe and the adjoining Asiatic territories. It is more than twice the size of the whole of Europe and covers nearly one-seventh of the total land surface of the world. As a political unit its area is exceeded only by that of the British Empire. It is bounded on the north by the Arctic Ocean and on the west by Rumania, Poland, the Baltic Sea and Finland. The east is bounded by the Pacific Ocean. Numerous mountains, plateaus, deserts and semi-deserts, inland seas, etc., form the southern boundary of the State.*

The coast-line is regular and extremely short in comparison with the size of the country. The northern shores are frozen during winter as they are in the Arctic circle. The Pacific coast also remains closed to navigation during winter. Murmansk is the only ice-free port throughout the length of Russian coast-line. As the port is situated on the extreme north-west it receives the warming influence of the North Atlantic Drift. It has recently been connected by rail with Leningrad.

Throughout the whole of Russia winters are excessively cold except in the extreme south. Rainfall and temperature are not much influenced by the bordering seas. Rainfall is maximum during summer.

The entire region to the west of Yenesei consists more or less of plains and lowlands. The highest point of the plain is a little above 1,000 feet. The regions to the east of the river Yenesei are highlands.

Russia, the largest country in Europe, is divided up into a number of Soviet Republics, which have grouped themselves into the Union of Soviet Socialist Republics (U.S.S.R.). Before the Bolshevist Revolution of 1917 the country was a unitary State ruled by autocratic Czars. Before 1939, the Soviet confederation consisted of 11 constituent Republics, *viz.*, Russia (in itself forming a Federation), the Ukraine, White Russia, Azerbaijan,

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* The terrritory of Russia consists of two disproportionate areas: the smaller (25 per cent. of total area) comprises Russia in Europe, the larger (75 per cent.) is in Asia.

Armenia, Georgia, Turkmenistan, Uzbekistan, Tadzhikistan, Kazak and Kirkhizia. These members of the Confederation include, moreover, numerous autonomous units (autonomous republics, autonomous territories, autonomous districts) inhabited by small nations. The total area of the Soviet Union in 1939 was 8,173,550 square miles. In March 1940, the twelfth Soviet Republic—the Karela-Finnish Soviet Socialist Republic—was created out of the territory ceded by Finland. The 13th, 14th, 15th and 16th Republics were formed in August, 1940. These are Moldavian S. S. S., Estonia, Latvia and Lithuania. Thus the total area of the Soviet Union in 1940 increased to 8,348,100 square miles. In 1945 the eastern parts of Poland beyond the *Curzon line* was also annexed to the Soviet Union. The transfer of Eastern Poland to Russia is the biggest territorial change in Europe after the World War II involving an area of 69,886 square miles.

Soviet Russia has a great number of racial groups, such as Great Russians (58·4 p.c.), Ukrainians (17 p.c.), White Russians (3·11 p.c.), Uzbeks (3 p.c.), Tartars (3 p.c.), Kazakhs (1·83 p.c.), Jews (1·73 p.c.), Georgians (1·34 p.c.) and Armenians (1·27 p.c.). *The population of Russia has always grown rapidly.* From 74 million population in 1858, the figure rose to 178 in 1912. In 1942 the population was 202 million, which is about 9 per cent. of the world's total population. The greatest concentration of population is found in the Ukraine where more than 20 p.c. of the inhabitants of Soviet Russia live. The average density per square mile in European Russia is twenty-five persons, and in Asiatic Russia, less than two persons. Although there are more than 150 towns with more than 100,000 population in each, nearly half of the total population live in villages.

Trends in Economic Development

Before the Revolution of 1917 Russia was industrially a backward country. The Soviet Government has brought in a new life to the country. Within a short span of time, the Union has developed its industries remarkably. In 1928-29, the Government devised a five-year economic programme not only for reorganising agricultural economy but also for reorganising the heavy industries. 'The Second Five-Year

Plan' (1933-37) was formulated and worked to make the country industrially self-sufficient and to redistribute her industry in such a way as to locate her great industrial enterprises where power was available or where there was an abundant supply of raw material, and also, to utilise to the full the labour resources in the different parts of the country. When the Second World War broke out the Union was working the Third Five-Year Plan in which provisions were made for "(1) increased regional self-sufficiency, especially as regards food-stuffs, fertilizers, bricks, cement, etc., and (2) for a further shift of the industrial centre of gravity to the east." The Fourth Five-Year Plan for 1946-50 has been introduced with the main purpose of rehabilitating the war-ravaged regions of the country. Russian economy suffered the most grievous losses at the hands of the Germans in 1941-44. Russia lost a half of her coal and steel capacity and two-thirds of her iron ore. Similarly the oil industry sustained substantial injury and the damage done to agriculture was considerable. Besides, 25 million people were rendered homeless due to destruction of dwelling houses by bombing. Soviet sources place the material damage done to their country at half the material devastation in Europe estimated in money terms at 679 billion roubles. The Plan aims not only at restoring agriculture and industry to the pre-war levels but also at surpassing these levels to a great extent. The Plan also urges the development of certain territories of U.S.S.R. The Plan, however, does not mention the areas over which the industrial enterprises will be distributed.

Soviet Russia has widely extended the cultivation of crops. Great attention is paid to the proper regional distribution and increased production of wheat, sugar beet, cotton and rice. Russia is now the greatest wheat-producing country in the world.

RUSSIAN FARMING. The farming activities in Russia are at present carried on under two methods—*Kolkhozes* (large-scale collective farms) and *Sovkhozes* (large-scale State farms). Under Kolkhozes system, the farmers combine and work collectively with the support of the State which supplies machinery, seeds and tractors. About 75 families work in each collective farm. This organisation was devised to eliminate the evils of private property. Each member works for about 150 days for the Kolkhoz ; the rest of the year, he works for himself. Sovkhozes or State farms are mostly to be found in the south-east of European Russia and in Siberia. For the most part they concern themselves with the production of seeds of good quality, breeding of livestock on scientific lines and the development of specialised farming methods. About ten per cent of the crop lands are cultivated by Sovkhozes.

At present crop area occupies only 10 per cent. of the total land area of Russia in spite of the great efforts by its people and their government. There are definite climatic limits to the extension of agriculture. Temperature conditions limit the spread of agricultural settlements Polewards, while in the Central Asia want of rainfall is the main obstacle. More than one-fourth of the Soviet Union is entirely unsuited for agriculture because of climate, soil or relief. Another one-fourth of the area consists of soils which lie in the agricultural zone but are at present not suited for agriculture. Good agricultural land in Soviet Union covers approximately one million square miles and enables the country to be rated as a great agricultural region of the world.

The special feature of Soviet agriculture is that the direct consumption of food-stuffs is so high that there is never a great percentage of marketable goods. Another feature is that the northern Russia is mainly a grain-consuming area and can satisfy only ⅙ of its demand by its own production of food.

Russia's Contribution to the World Production of certain Agricultural Crops (in p.c.)

	1913	1939		1913	1939
Grain	16	25	Flax	30	58
Sugar beet ..	10	25	Cotton	3	10

Wheat is the principal grain crop of the U.S.S.R. In European Russia, wheat is not only cultivated in the rich black earth lands of the south but also in the more northerly latitudes by clearing the forest and adopting scientific methods. Wheat cultivation has increased rapidly in western Siberia as well. Orenburg region, Kazak and Karakalpak are the other principal wheat-producing regions. In spite of the rapid extension of wheat cultivation in other areas, the Ukraine is still the leading wheat-producing region in Russia.

Sugar beet is cultivated in the region between Kiev and Kursk, Transcaucasia, West Siberia and Lake Baikal region. Soviet Russia raises nearly one-fourth of the world production of sugar beet and occupies the first place in the list of producers. The other crops are rye, barley, flax, tobacco and tea. Russia produces about 50 per cent. of the world's output of rye. The areas for barley are the Ukraine, Steppe region and Siberia. Russia raises about ⅙ of the world's barley production. She also supplies half of the total world requirements of flax.

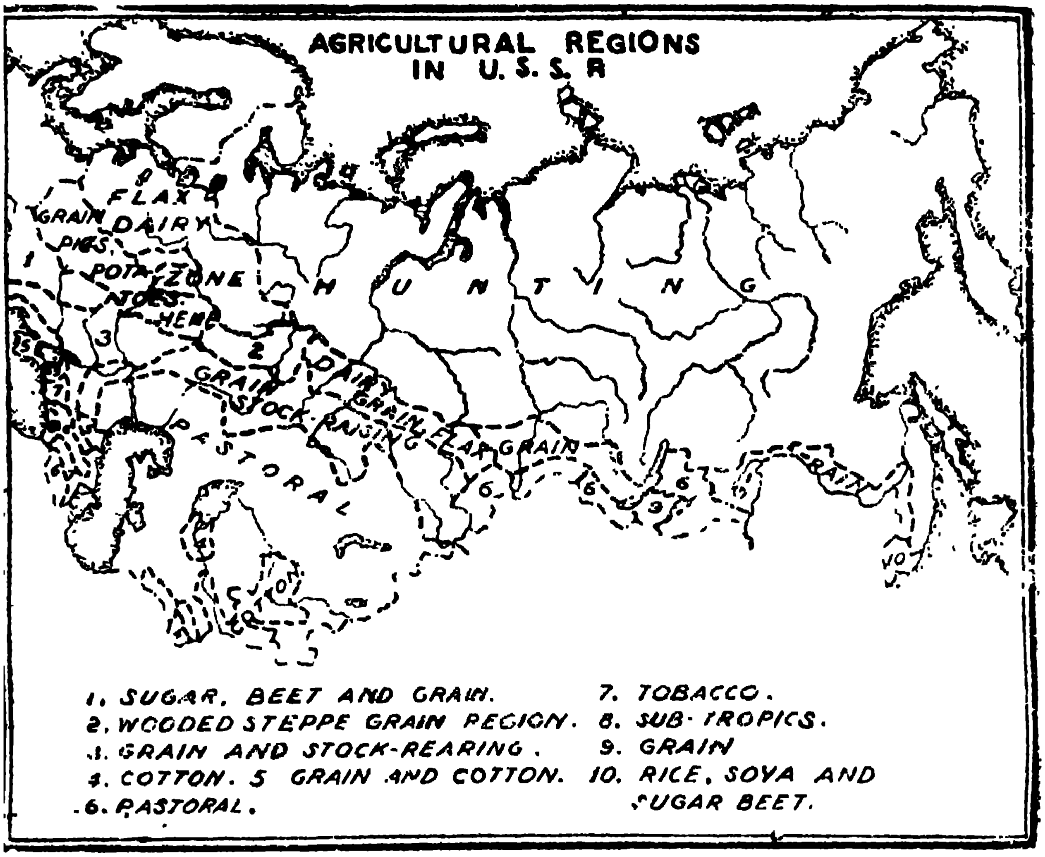
AGRICULTURAL REGIONS IN U.S.S.R
FLAX
GRAIN
DAIRY
PIGS
POTATO ZONE
HEMP
GRAIN
DAIRY
STOCK RAISING
GRAIN FLAX GRAIN
PASTORAL
H U N T I N G
GRAIN
1, SUGAR, BEET AND GRAIN.
2, WOODED STEPPE GRAIN REGION.
3. GRAIN AND STOCK-REARING.
4. COTTON. 5 GRAIN AND COTTON.
6. PASTORAL.
7. TOBACCO.
8. SUB-TROPICS.
9. GRAIN
10. RICE, SOYA AND SUGAR BEET.

FIG. NO. 53.

Cotton is the most important plant of the Russian staple industries. At present U.S.S.R. is able to meet all her home requirements and also to export cotton fibre. Cotton is cultivated (*a*) in the Crimea, (*b*) to the north of the Black Sea, (*c*) to the north and east of the sea of Azov. *Tea* and *rice* are also being raised in considerable quantities.

In 1948 a 15-year plan was introduced to conquer drought and revolutionise agriculture. According to this plan an area comprising of 13·5 million acres is to be afforested by

1956. Afforestation is considered to be the only reliable method to check soil erosion. Under this plan, huge forest shelter belts are designed to be erected in several rows along the banks of the Volga, Ural, Don and Northern Donetz on a total length of 3,300 miles. For irrigation, 44,000 ponds and reservoirs with irrigation canals are to be provided.

MINING. Russia is very rich in minerals. *She is almost self-sufficient in all strategic minerals essential to modern warfare.* As a world supplier, she takes the fourth place in her output of coal, the second for oil and iron-ore and the first for manganese and phosphates. Many new mining regions are being discovered and exploited.

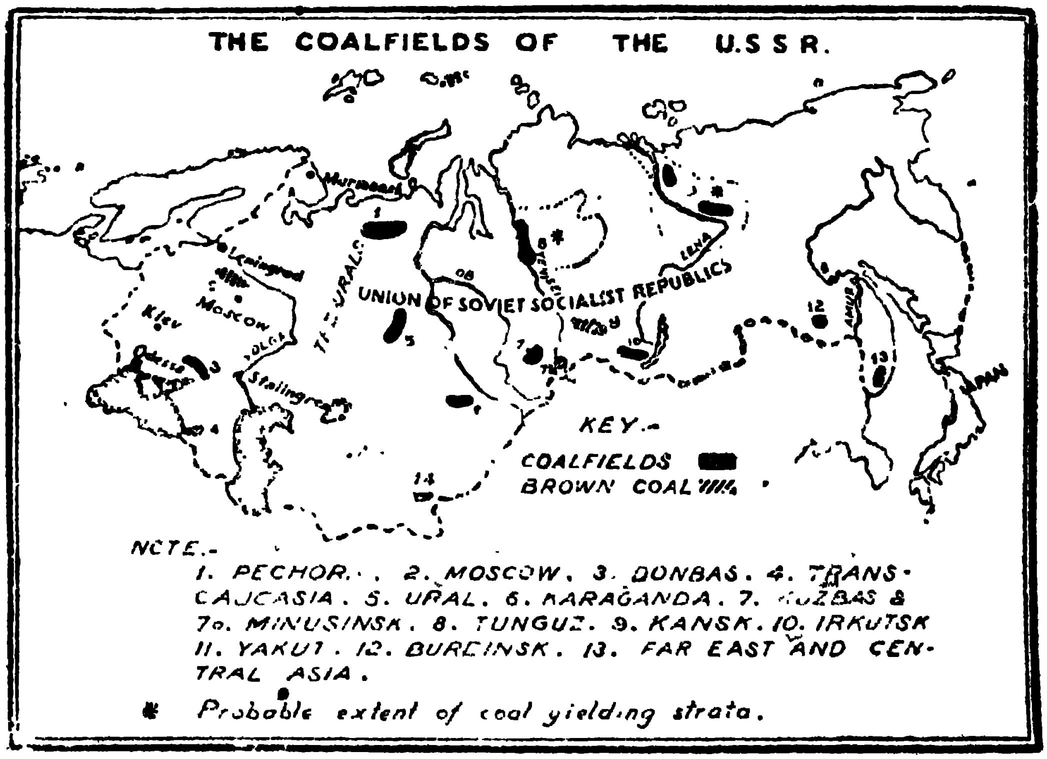
THE COALFIELDS OF THE U.S.S.R.
Murmansk
Leningrad
Moscow
Kiev
Volga
Stalingrad
THE URALS
UNION OF SOVIET SOCIALIST REPUBLICS
LENA
AMUR
KEY.-
COALFIELDS
BROWN COAL
NOTE.-
1. PECHORA. 2. MOSCOW. 3. DONBAS. 4. TRANSCAUCASIA. 5. URAL. 6. KARAGANDA. 7. KUZBAS & 7a. MINUSINSK. 8. TUNGUZ. 9. KANSK. 10. IRKUTSK 11. YAKUT. 12. BUREINSK. 13. FAR EAST AND CENTRAL ASIA.
* Probable extent of coal yielding strata.

FIG. No. 54.

U.S.S.R. supplies more than one-tenth of the world production of coal and occupies the fourth place in the list of coal-producing countries. The annual output of coal is more than 93 millions of tons. In 1913 the output was only 29 millions of tons. Before the Revolution of 1917 the Donetz coal-field alone supplied more than 90 per cent of the Russian output; to-day it supplies about 60 per cent. The principal coal-fields of modern Russia are Kuzbuz (West Siberia), Tunguz (the

Yenesei basin), Irkutsk, Donbas, Pechora (in the Tundra region of the north of European Russia), Burein (in the Amur basin), Yukut (the Lena basin), Kansk (brown coal), Karaganda (in the Steppe region of Asiatic Russia), Minusinsk, Moscow, Central Asia (South of Ferghana), Ural (near Sverdlovsk and Chelyabinsk), Far East (near Vladivostok), and Transcaucasus (near Batum). The Asiatic coal-fields of Kuzbuz, Minusinsk, Irkutsk, Burein and Vladivostok supply fuel to the Trans-Siberian Railway.

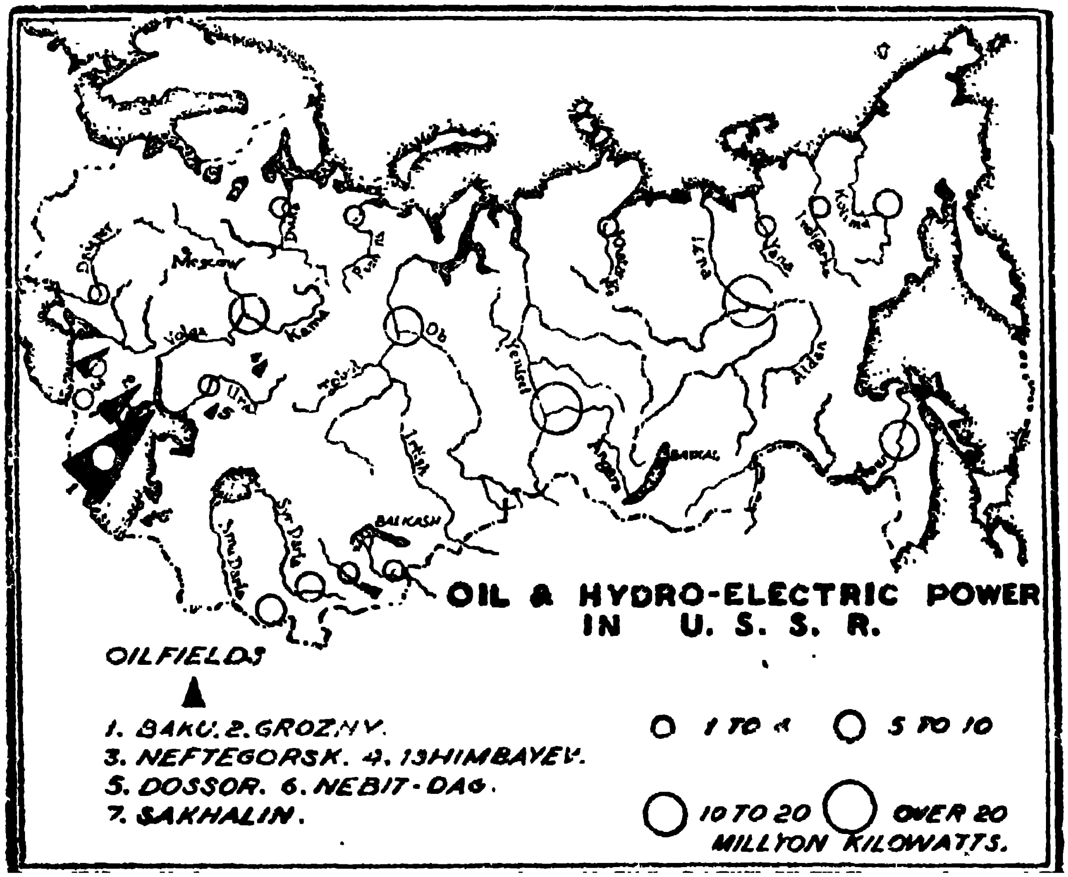

FIG. No. 55. Till 1939 Soviet Union furnished about 80 per cent of the oil production of Europe and 10 per cent of World production.

It is estimated that the coal reserves of the Soviet Union are in excess of one and one half trillion tons distributed from Moscow to Kamchatka. About 90 per cent of these reserves lie in Asia.

The U. S. S. R. was until 1939 the second producer of petroleum in the world, but it has now yielded that place to Venezuela. 1951 — 42·3 [illegible]

The oil-producing regions are the Caucasus-Caspian (90 p.c.), Central Asia (4·9 p.c.), Volga-Urals (4 p.c.), and the Far-East (1·1 per cent.). The important oil fields are Baku, Grozny, Neftergorsk, Ishimbayev, Dossar, Nebit-Dag, and Sakhalin. Oil is found on the western side of the Urals at Ukhta in the north ; Chussov, to the east of Perm ; Staerlitamak, to the east of Samara. In 1938, the oil production was 32·23 million tons against 9·23 million tons in 1913. The Third Five-Year Plan provided Soviet's oil-production at 38·5 million tons in 1942.

A number of pipe-lines move the oil to the industrial districts and to the coast for export—(*i*) From Baku to Batum on the Black sea, (*ii*) from Grozny and Maikop to Tuapse on the Black Sea. The petroleum reserves are estimated to be over six billion metric tons.

Russia is one of the greatest iron producers and ranks third in the world. The principal iron-ore regions are :—

(1) In the neighbourhood of Kursk.
(2) Near Orsk in the Southern Urals.
(3) At Telbes in the Kuzbuz region.
(4) The Murmansk peninsula.
(5) The Magnet mountain near Magnitogorsk in the Urals.
(6) At Krivoi Rog in the Ukraine.

In 1938 Soviet Russia produced more than 30 million tons of iron-ore. The reserves of iron-ore have been estimated at nearly 10 billion tons. Krivoi Rog in the Ukraine and the Urals are the largest producers.

Soviet Union is the leading manganese producer in the world. In European Russia, manganese is raised in two principal localities : (*a*) near Chiature in the Caucasus of Georgia, supplying most of the ore for export; (*b*) near Nikopol in Southern Ukraine, about 100 miles north-west of Crimea, supplying most of the ore for domestic consumption. Further east, there are other deposits of manganese at Orenburg in the middle Volga, at Bashkiria in the southern Urals and on the Muzul river in Siberia. Other important minerals are gold, copper, aluminium-ore, bauxite, nickel, platinum, lead and zinc. Russia is one of the leading producers of platinum. Gold deposits are found in the Urals, the Lena Basin and the lake

Baikal region. In 1939 Russia produced about 12 per cent. gold, and 22 per cent. chromium of the world total. Chromium deposits are found in the Urals, Orenburg, Bashkirian and Kasaksky.

Russian Forests

Russia contains more than one-third of the total forest land of the world. There are vast resources of pine, fir, larch and spruce which are used for timber, paper-making and the manufacture of cellulose. The magnitude of the industry can be judged from the fact, that while in 1935 Russia produced 112 millions of metric tons, Canada, the second largest producer, raised only 48 millions of metric tons. There are, however, enormous difficulties in the adequate utilization of forest resources. *The uneven geographical distribution of forests, the inadequately developed transport system, remoteness from the centres of domestic and foreign consumption and the shortage of labour are the main handicaps in Soviet Russia.* The forest lands of the Union cover 2,310 million acres, the major portion of which lies in Asiatic Russia. Most of the forest lands of European Russia are in the north although the Caucasus contains an inexhaustible supply of many valuable varieties of timber.

TIMBER PRODUCTION AND DISTRIBUTION OF FOREST AREAS IN U. S. S. R.

Region	Area (p.c. of the total)	Timber (p.c. in total)
Siberia and Far East ..	75	33
Northern Region of European Russia ..	12	22
Volga Region ..	8	21
Caucasus ..	2	2
Southern Region (Ukraine and White Russia)	1	6
Old industrial region (Leningrad, Moscow and Kalinin) ..	2	15

Manufactures and the Industrial Zones

Within recent years Soviet Russia has made considerable progress in the manufacturing industries. It is the aim of the Soviet Organisation to effect a wide-spread redistribution of industries throughout the country, so that no particular area can have industrial monopoly. The principal manufactures are machinery, farm implements, motor tractors, motor cars, textiles, leather, pottery, chemicals, refining of sugar, etc. The Soviet industrial organisation thus tries to be dependent on those raw materials which are found only in Russia. There are six chief industrial regions in the Soviet Union of which the Moscow region is the most important. Ninety per cent. of the cotton manufactures are concentrated in the *Moscow region.* Moscow and Ivanove are the two important cotton centres. Metal industries are localized at Tula, Moscow and Gorki. The Moscow area is also responsible for 60 per cent. of the Union's chemical industries.

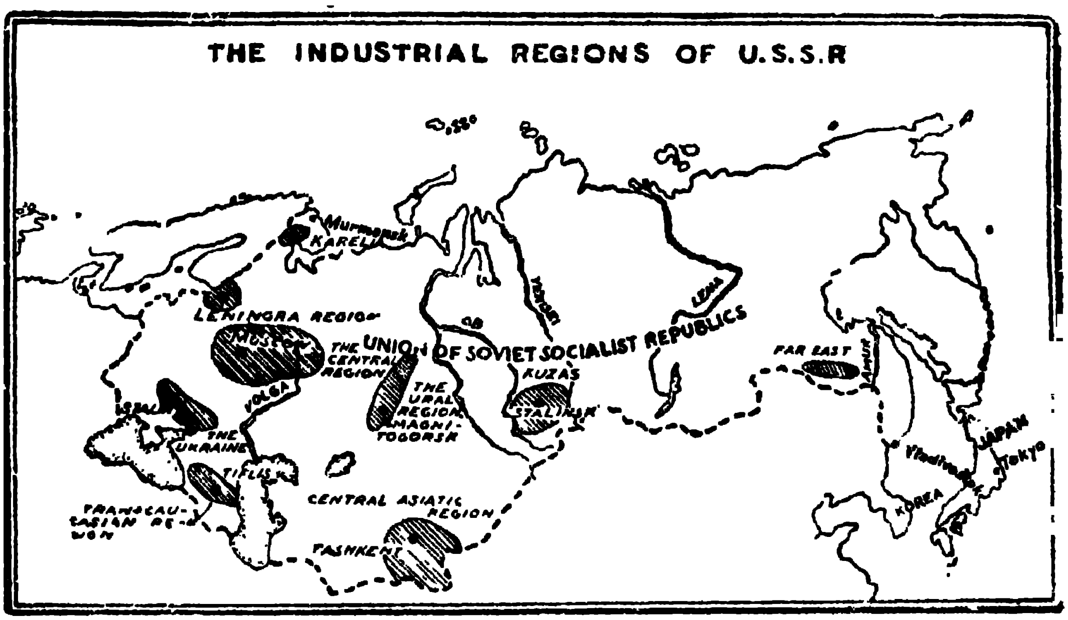

FIG. No. 56.

The next important industrial region is the *Ukraine and its margins.* The Donetz basin of the Ukraine supplies about 45 per cent. of the Soviet steel and 70 per cent. of the aluminium. The Donetz basin is also important for sugar mills, flour mills and leather factories. The industrial centres are Kiev (grain market), Odessa (agricultural machinery), Krivoi Rog (iron and steel), Dnepropetrovsk (general engineering and thermal power station), Rostov (agricultural machinery), Voroshilovgrad (locomotives), and Stalingrad (iron and steel works).

The *Ural industrial area* is comparatively new. This area includes Perm, Sverdlovsk, Chelyabinsk, Orenburg, and the

Bashkir regions. The Ural area produces about 20 per cent. of the pig iron and 25 per cent. of the steel produced in the U.S.S.R. The other industries are chemicals, railway workshops and armament foundries. The important towns are Magnitogorsk, Nizhni Tagil, Chelyabinsk, Sverdlovsk and Orsk. The Ural area is served by the Trans-Siberian and the Caspian Railways.

The Kuzbuz region in western Siberia has, of late, become an industrial area of great importance. The important industrial towns are Kemerovo (oil refining and metal works), Stalinsk (iron and steel works, locomotives) and Tomask (aeroplanes).

Soviet Central Asia has developed cotton industry, chemicals and iron and steel industries. Tashkent, Bukhara and Stalinabad are the chief towns of Central Asia.

After the outbreak of the World War II *the Far Eastern Area* assumed great importance. As the area is more than 2,000 miles from the Urals, the Soviet Government has made it economically self-sufficient. Yarkutask, Vitim, Komsomolsk, Orlovok and Vladivostok are the chief towns of the Far Eastern Area.

Foreign Trade

The Union plays relatively a small part in the world-trade and the foreign trade is controlled by the State. Exports consist mainly of raw materials (petroleum, timber, furs, flax; to the East, cotton as well) and, in a lesser degree, of manufactured articles (to the East) and food-stuffs (wheat, oats, butter, oil-cake). Imports consist mainly of raw materials which the Union is not yet able to produce in sufficient quantity (copper, rubber, wool, cotton) and manufactured goods like cutlery, machinery, etc. Germany, the U. K. and the U. S. A. are the important trade partners of Soviet Russia. The volume of Soviet trade with Asia is increasing from year to year.

Transport

The means of communication in U. S. S. R. are very important because of the vastness of the territory, immense but sparsely scattered population, the unequal distribution of *natural resources, the unfavourable location of industries and the concentration of grain production in the south of the country.* The chief means of communication are by rivers, railways and air.

The U. S. S. R. has the largest river system in the world. The importance of the rivers of the U. S. S. R. is determined by the climate, the geological structure, topography and the size of the territory. Although the rivers are navigable and widely used for transport, it is unfortunate for Russia that these are either flowing to the land-locked seas or to the Arctic sea. The rivers freeze in winter and dry up in summer. The navigation in some cases is impeded by rapids. The early summers are usually the period of flood for the lands round the mouths of rivers flowing to the north, as the snow in the upper parts of such rivers melts first. However, the rivers are long, have a gentle fall and a slow current which make navigation possible right up to their sources. They also receive many tributaries and flow through agricultural lands. The Russian rivers are also utilized for the production of hydro-electric power.

Altogether the Soviet Union has more than 180,000 miles of navigable rivers. The sources of the most of the rivers are in plains and are fed by rain, lake and the melting snow. In spring when the snow melts, the rivers spread out by several miles. The principal rivers of European Russia are the Dvina, Dneiper, Don and Volga—the last-named being the greatest river, in the basin of which lies more than half of Russia. The Obi, Yenesei, Lena and Amur are the principal rivers of Siberia. The Amu-Darya and the Syr-Darya are the principal rivers of Central Asia. They have their sources in mountains and are fed by the melting of snows. Russia's waterways handle about 10 per cent. of the total goods traffic. These also provide enormous supplies of hydro-electric power. The potential hydro-electric energy is about 280 million k.w. The U.S.S.R. rivers are also important for irrigation, although full use has not yet been made so far specially in Central Asia and Transcaucasus.

For some years the Soviet Union has been trying to open up a northern passage along the coasts of the Polar Sea. Although this passage is only navigable for a few months in the year, it establishes direct maritime communication between Murmansk, Leningrad and Vladivostok.

Soviet Union has about 62,000 miles of railways which serve both economic and strategical purposes. Of this total mileage, less than two per cent is electrified. The railway network is dense in Western U.S.S.R. In the Urals too, the network is heavy but elsewhere the rail lines are inadequate. Most of the lines are single track. Moscow, the focus of the system, is linked with the Urals, the Ukraine and other parts of industrial Russia to the north and south.

Russia has made wonderful progress in air-transport. All important Russian cities are linked by regular air services. There are three principal airways, all radiating from Moscow. The one goes to Vladivostok on the Pacific coast *via* Kazan, Sverdlovsk, Omsk, Irkutsk, Chita and Khabarovsk. The second line runs from Moscow to Stockholm *via* Riga. At Riga it is connected with the German airways. The third line goes to Kabul from Moscow *via* Orenburg and Tashkent.

Trade Centres

Moscow, the greatest industrial centre of Russia, stands on high ground above the river Moskva. It is not only the capital but also the great nodal centre of Russian routes ; from it railways diverge to different directions. Its manufactures are textiles and metal goods, leather goods, paper, etc. The population is over four millions.

Leningrad, at the mouth of the Neva, is a great Baltic port. It is the natural outlet of Russia to western Europe. For four months and a half in the year the port remains ice-bound. Ship-building is important, specially the construction of ice-breakers. Paper, cellulose and aluminium are the manufactures. Its population is more than three millions.

Baku, on the Caspian Sea, is one of the most important oil-yielding centres in the world. Oil is carried for export by pipe-lines to Batum on the Black Sea. Its population is nearly one million. *Astrakhan,* near the mouth of the Volga, is a fishing port. *Murmansk,* on the north shore of the Kola Peninsula, is the only ice-free port of the north. The port has railway connection with Leningrad. *Odessa,* on the north coast of the Black Sea, is the chief port of Southern Russia. The principal export is wheat. *Kiev,* on the Dneiper, is a grain market of considerable importance. It has nearly half a million population. It is one of the oldest cities in Europe. *Rostov,* on the Don, near the north-eastern coast of the Sea of Azov, is an industrial centre where agricultural machinery is made. *Kharkov,* the capital of the Ukraine, manufactures tractors, motor cars and agricultural machinery. Its population is above half a million. *Dneipropetrovsk,* on the Dneiper, has important engineering works. A great dam has been constructed on the Dneiper to supply hydro-electricity to the industries. The population is about 400,000

Switzerland

A continental state with no direct access to the sea, Switzerland is bounded on the west by France, on the north and east by Germany, and by Italy on the south. A series of far-reaching economic and political factors have resulted from this geographical situation.

From a territorial point of view, Switzerland is one of the smallest European States. Although her total surface is only 16,000 square miles, her population is more than four millions. There are three important languages in the State. Seventy per cent. of the entire population speak German, twenty-one per cent. French, six per cent. Italian. Far from being a cause of dissension, this diversity of languages constitutes one of the chief reasons of Switzerland's existence in Europe. *"The State has successfully solved the great nationalistic problems which are to-day at the root of so many international difficulties ; the State is thus an amalgamation of distinct ethnical groups."**

It is the most mountainous country in Europe. The Alps, grouped round the Gottard Massif reach the highest point in Switzerland with a peak of 12,902 feet high. This Alps is also the source of many rivers which flow to all parts of Europe.

Twenty-two per cent. of the total area of Switzerland is barren land. Cultivated land and Alpine pastures form fifty-six per cent. of the country's productive area and twenty-two per cent. is forest land. Only about three-fifths of the population can be fed on the produce of the soil and two-fifths are permanently dependent on food import.

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* In Switzerland, no matter what a man's mother tongue may be, he is first and foremost a Swiss, and not a German, a French or an Italian.

Wheat, rye, oats, barley, maize, potatoes and tobacco are the chief agricultural crops. *Fruits and grapes* are extensively raised. Pasturage constitutes one of the principal features of Swiss husbandry, forming the basis of cattle-breeding and milk production, the development of which ranks among the most important factors of Swiss economy. Besides the production of milk and meat, pedigree cattle-breeding for exportation constitutes one of the principal items. Switzerland's main item of dairy produce is cheese, the consumption of which is considerable both at home and abroad. The cheese trade is conducted at Berne, Lucerne, Zurich and St. Callen.

The country is poor in minerals. *Coal* is totally absent. *Real marble, asphalt, salt and glass-sand are found.* The handicap due to the want of coal has been removed by developing water-power which is greatly facilitated by the existence of innumerable waterfalls and rapids. The power stations transform the energy of the mountain torrents and rivers into electricity. The production capacity is 2·6 million units. Hydro-electric power is used in industries and transport. There are 31 large hydro-electric power-stations in Switzerland, each of which has an output exceeding 20,000 H.P.

The industrial expansion of Switzerland is great. Swiss production is essentially of manufacturing type. "The general tendency of the industry is to seek compensation for the want of fuel and raw materials and for inadequate or expensive means of communication by the manufacture of commodities on which skilled labour may be expended ; of this tendency the electric and chemical industries and watch-making are typical." Swiss manufactures have a good reputation in the world market.

Industries :

(*a*) Textile industries.
(*b*) Machine and metal industries.
(*c*) Watch-making and allied industries.
(*d*) Chemical industries.
(*e*) Food and tobacco industries.

Silk industry occupies a very important position in the textile branch. This industry is geographically limited to southern Switzerland. Four-fifths of the products are destined for exportation. The Swiss silk goods are in great demand throughout the world. The industry is centred at Zurich. Silk ribbon industry is carried on at Basle. A large portion of the world's consumption of ribbon is covered by Switzerland which exports over 95 per cent. of its total production. Embroidery and lace industry, knitting and linen industry and hosiery are the other branches of textiles, which are equally important in Switzerland.

Swiss metal works furnish articles of aluminium, copper, brass, nickel and all kinds of alloys. Aluminium bars are turned out in large quantities. *Watch-making is one of Switzerland's oldest and most prosperous industries.* To-day it is mainly carried on in the Zura district. The industry engages about 67,000 hands. About 95 per cent. of the output of the watch-making industry is destined for exportation. This industry ranks first in the world.

Condensed milk, chocolates, cheese, biscuits, etc., are the chief products of the food industry.

The touring and hotel industry of Switzerland is of considerable importance. No other country in the world offers, in so limited an area, such a great variety of natural beauty and picturesque scenery as Switzerland does. It is known as the "Playground of Europe". Practically every type of European climate is to be found within her boundaries. Large numbers of people from different parts of the world visit the country and provide a very important source of income to the State.

Switzerland has no direct access to the sea. Her railway system is highly developed, ranking third in Europe, next to Belgium and England. It possesses in all 5400 km. of railways, representing 1·35 km. per 1000 of population. The most striking feature of railway development is the marked progress in electrification. At present more than 70 per cent. of the Swiss railways is electrified. There are about 10,000 miles of *rail road.* Aerial service is being developed.

Berne (10,000) is the seat of the Government and the centre of political and economic life. It is also a route-town. The largest town is *Zurich.* It is not only a great railway centre, but a great industrial town also. It manufactures cotton, silk and machinery. *Basle,* situated on the bend of the Rhine, is one of the most important traffic junctions between Switzerland, Germany and France. Other towns are Geneva, Winterthur, Fribourg and Lausanne.

Hungary

Hungary is a small state lying in the middle of the Danube area. It has an area of 35,875 square miles with 8,684,000 inhabitants. The Hungarians or Magyars are a people of Asiatic origin. Till 1919 Hungary was united with Austria in the Dual Monarchy of Austria-Hungary. As a result of the first Great War Hungary became an independent Republic, but she lost two-thirds of her territory to Rumania, Czechoslovakia and Yugoslavia.

The relief of Hungary is typically plain and is drained by the Danube and its tributaries like the Drava, Sava, Tisa and Koros. The country is surrounded on all sides by mountains of the Alpine system. The climate is continental with hot summers, cold winters and light summer rainfall . This climate has made Hungary a grassland region, favourable to the growth of cereals.

The plain of Hungary has acted as one of the granaries of Europe for many centuries. Over 80 per cent of the cultivated land is devoted to wheat and maize. Although Hungary is a large producer of wheat, the yield per acre is mediocre. In all great wheat-producing countries the average yield per acre is 30 bushels, but in Hungary it is never more than 20 bushels. The other important crops are rye, barley, oats, sugar-beet, potatoes, tobacco etc. More than two-thirds of the people is provided for by agriculture. Recently good progress has been made in vineyards and the country produces more than 100 million gallons of wine.

Sheep-rearing, once an important occupation, is declining. There is little mineral wealth. Coal of good quality is found near Pects in the south-west which supplies nearly 7,000,000 tons of coal. Coal is required to be imported from Germany, Czechoslovakia and Poland. Some iron-ore is found at Salgotarjen, but still a large consignment has to be imported to supply the needs of the metallurgical industry.

The industries are mainly those which are dependent on agriculture. These include flour-milling, sugar-refining and distilling. Budapest is the outstanding centre of flour-mills and is known as the "Minneapolis" of Europe. Cotton textile industry has been established recently. The other industries are tanning and engineering.

Hungary has about 60,000 km. of roads. These roads are quagmires of mud when it rains and of little use for modern transport. The rivers are all navigable and provide important means of transport. The great problem is the difficulty of outlet to the sea. The outlet *via* the lower Danube necessitates passage through Rumania. Hamburg, though convenient for Hungarian trade, is far off, and its use entails crossing of other countries. A serious drawback is the lack of direct outlet to the sea. Hamburg, Fiume and Split—all outside Hungary—handle the foreign trade of the country.

In March, 1939, Hungary annexed Ruthenia (Carpatho-Ukraine) which was formerly a part of Czechoslovakia. Ruthenia is mountainous and its people are very poor. Sheep-rearing is the main occupation.

Budapest, the capital, is the chief manufacturing city. It consists of two towns and is situated on either side of the river Danube—Buda on the right and Pest on the left. It is the greatest flour-milling town in Europe. Electrical machinery is also made here. It is also an important railway junction, and the natural collecting centre of the plain. The population is a little above one million. *Szeged* is a village town. Sugar-refining, distilling and brewing are the industries of this place.

The Balkan States

Rumania, Yugoslavia, Bulgaria, Albania and Greece, together with Turkey, are known as the Balkan States. These states are mostly mountainous. Commerce is negligible. Agriculture and animal-rearing are the two main occupations of the people.

Bulgaria*

Bulgaria lies to the south of the lower Danube and occupies the eastern part of the Balkan Peninsula. It is bounded by the

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* Bulgar means a man with a plough, and four of every five Bulgarians are farmers.

Danube on the north, Greece on the south, the Black Sea on the east and Yugoslavia on the west. It has an area of 40,000 square miles and a population of five millions and a half. The Bulgarian people are of mixed Slav and Mongol origin.

This country has a great diversity of relief, soil and climate. The climate is, on the whole, of the continental type. In the south the Mediterranean climate prevails. Nearly the whole of the northern half of the country is a highland region. The extreme northern area is a lowland region. The most fertile and productive lowland of the country lies to the south of the Balkan mountains. This area is drained by the river Maritza. The Rhodope mountains cover the whole of the southern and western regions of the country.

Bulgaria is one of the poorest and most backward countries of Europe. It possesses considerable mineral wealth. Deposits of copper, manganese, coal, lead, zinc, marble and granite exist. But the lack of fuel, inadequate railways and poor capital are responsible for the absence of mining industry. Only a little coal and copper are mined by some foreign companies.

Oak, beech and other deciduous trees, which are extensively found in the mountainous parts of the country, provide timber for export. The production of silk cocoons is an important industry.

Agriculture is the main occupation of the people. More than 80 per cent. of the people depend directly on agriculture. Wheat, maize, barley, tobacco, sugar-beet, vines and fruits are important. In the valley of the south-west fruits grow in abundance. Cotton and oats are also grown. The cultivation of roses for the manufacture of scent is followed on the hill slopes of the Balkan mountains. The vale of Kazanlik is one of the most important rose-growing areas. *Attar* of rose distilled from the blooms once formed an important and valuable article of export. A small quantity is still produced. Pastoral occupations are also important.

The railways are not greatly developed. They radiate from Belgrade—one to Budapest in the north and another to Salonika in the south. The sea-outlets: (*i*) Sofia to Varna, on the Black Sea, along the northern side of the Balkan mountains; (*ii*) Philippopolis to Burgas, on the Black Sea, along the southern side of the Balkan mountains ; (*iii*) Maritza Valley to Dede Agach, the nearest port to Bulgaria.

The country has relatively little foreign trade. Tobacco, maize, *attar* of roses and eggs are the chief exports.

Exports		*Imports*	
Live animals	3·9 p.c.	Manufactures	61·7 p.c.
Food	40·3 p.c.	Raw materials ..	43·3 p.c.
Raw materials ..	52·3 p.c.		
Manufactures ..	3·5 p.c.	Food	4·0 p.c.

The principal trade centres are *Burgas, Varna, Sofia* and *Philippopolis*. Varna and Burgas, on the Black Sea, export tobacco, eggs, *attar* of roses, maize and silk. During winter the traffic is not considerable in view of the fact that the Danube becomes ice-bound. The capital of Bulgaria is *Sofia*. It is the largest town in the country with a population of 280,000.

Albania

This small and rugged country is the poorest and most backward region in the Balkans. The area of the country is about 11,000 square miles. It is situated on the Adriatic, between Yugoslavia and Greece. Excepting the coastal area, the country is mountainous. It has a population of about a million—mostly Muslims. The people are primarily pastoral. They are a brave but revengeful people. The coastal plains have a Mediterranean climate where fruits and cereals are grown. There are no railways in the country ; roads are inadequate and large areas of the country are waste lands.

"The position of Albania opposite and close to the heel of Italy gives the country a strategic importance at the entrance of the Adriatic Sea."

The extent of mineral resources of Albania is still unknown. A petroleum field has been discovered and it is being worked. *Tirane*, the capital, is centrally situated just on the inland edge of the main coastal plain. Its population is a little over 30,000. *Scutari* is the largest town and stands on the plain surrounding Lake Scutari. It is noted for melons. *Durazzo* is the chief port.

Greece

Greece is the most easterly mountainous peninsula stretching southward into the Mediterranean, together with Crete and numerous islands in the Ægean and Ionian Seas. It is a mountainous country. The peninsula is so broken and indented that the inhabitants have always been primarily sailors and traders. No part of the country is more than 80 miles away from the sea. The climate is typically Mediterranean, but Greece suffers from a rather low rainfall which makes cultivation difficult for lack of water for irrigation. The total area of the country is 51,168 square miles with 7·96 million population in 1949.

There are three natural divisions in Greece—(*a*) The Peninsula, (*b*) The Macedonian coast-lands, (*c*) The islands.

The Peninsula is entirely mountainous. Coast-lands are lowland areas. The main occupation of the people of this area is the rearing of sheep and cattle. Greece has more goats per square mile than any other country in the world. In the coastal lowlands of the Peninsula, the Mediterranean crops are raised. Along the western coast of Morea, in southern Peninsula, grapes are extensively cultivated. These are dried and exported as currants. *Greece is the leading exporter of currants in the world.* Sometimes the production is so great that it becomes necessary by law to restrict the cultivation of grapes.

The Macedonian coast-lands are fertile, and, therefore, important for agriculture. Wheat, cotton, rice, olives and grapes are grown. In Eastern Macedonia the soil and climate are peculiarly suitable for producing the best tobacco leaf.

Although Greece is an agricultural country, only one-fifth of the total area can be cultivated. Methods of cultivation are primitive and yields per acre poor. One of the greatest of all Greek industries is the production of olive oil. There is no region of Greece where olive tree is not found.

The mineral deposits are not numerous but they are important. The chief minerals are salt, lead, marble and iron-ore. Zinc, copper, silver and antimony are also found. Lead from the ancient mines of Laurium in Attica is of value, but more important is magnesite of which the annual production is about 50,000 tons. The chromium mines are the most important. In the World War II the magnesite and chromium mines of Greece proved to be a great asset to Germany, which suffered from an acute shortage of these minerals, so vital for armaments.

Manufacturing industries are little developed. Industries include woollen and cotton weaving and spinning, the production of wine, olive oil and chemical products. Cigars and cigarettes are also manufactured. Wine and fruits are exported in large quantities. As the country is not self-sufficient, she must exchange her wine and fruits for food supplies.

There are now more than 1,500 miles of railways which are all confined to the eastern part of the country. They are absent in the north-western side of the peninsula. Roads are bad and inadequate. Rivers are short and swift-flowing and are of little use for navigation.

As every important town is on the sea, the Greeks are essentially a maritime people. The prosperity of Greece depends on sea commerce. Greece is not self-sufficient in food, and much is to be imported by sea from the south. Sea commerce is, therefore, of vital importance to Greece.

Athens, the capital, has been a famous city for about three thousand years. It has a population of 400,000. Its chief port is *Piraeus*. *Salonika* is the most important trade centre of Greece. It is also one of the chief ports of southern Europe. It stands on the Gulf of Thessalonika. It is connected by railways with the important towns of the Balkans.. It exports grain, animal products and tobacco, and imports textiles and iron goods. Other important trade centres are *Larissa, Stavros, Alexandropolis, Kalabaka and Katakolon.*

The Greek island.—(*a*) *Crete*—It is a long, narrow, mountainous island and stands across the mouth of the Ægean Sea. The climate is warm and wet. Agriculture is the main occupation of the people. Wine and oil are exported.

(*b*) *Ionian islands.*—The group lies off the west coast of Greece and includes small mountainous islands like Corfu, Lavkas, Kephallonia, Ithaca, Zante and Kythera. Fruits are important.

(*c*) *The Ægean islands.*—This group is mostly barren and produces a good deal of wine.

Yugoslavia

Yugoslavia occupies the southern portion of the plain of Hungary and the central and the north-west mountain regions of the peninsula. Its official name is the Kingdom of the Serbs, Croats and Slovenes. After the Great War of 1914-18, Serbia and Montenegro, together with Bosnia, Dalmatia and Croatia, which were formerly parts of the Austrian Empire, were united to form the kingdom of Yugoslavia. The word 'Yugoslav' means the Southern Slav. The area is about 96,000 square miles and it contains a population of some 14 millions.

A large portion of the country is mountainous: the highlands in the east are part of the Balkan heights, those in the west form the Dinaric Alps. The Dinaric Alps are composed of lime-stones. Low lands are found along the Adriatic coast and on the north-east, which is a continuation of the Hungarian plain.

There is a paucity of good cultivable land because of the mountainous character of the relief. At best, not over one-fourth of the land can be cultivated. Wheat, maize, tobacco, rice, etc. are the principal agricultural crops. The methods of farming are crude and the yield per acre is always small. Eighty per cent. of the people are agriculturists. The great majority of the people is, therefore, poor.

Grazing and stock-raising are the mainstay of thousands of people in Yugoslavia. Cattle, sheep, goats and pigs are reared in the eastern part of the country. The country has considerable mineral resources including coal, iron, copper and lead; but they are as yet little developed. Forest produce is an important source of income. About a third of Yugoslavia is clad with forests of oak, beech and pine.

The roads and railways of the country are in a lamentable condition. Yugoslavia has only a little over 10,000 km. of railways in an area of 2,49,000 square km. The railways belong to the State. The principal railway centre is Belgrade, which is connected with Istanbul in the south-east and Budapest in the north. It is also connected with Salonika in the south. The length of roads in Yugoslavia is 40,000 km.; this represents 2·25 km. per 1,000 of population.

With the exception of flour-milling and brewing, the country has practically no other manufacturing industry. The industrial and commercial backwardness of the country is due to a combination of factors, *e.g.* (*i*) want of coal, (*ii*) inadequate means of communication, (*iii*) mountainous character of the relief, and (*iv*) weak government. But the future possibilities of the country are great. Timber, maize, pigs, eggs, meat and cattle are the leading exports. The imports consist of machinery, textiles, iron goods and food-stuffs.

Belgrade is the capital of Yugoslavia and contains a population of 2,40,000. It is situated in the fertile interior plains at the confluence of the Danube and the Save. It is also the principal railway centre. *Zagreb* is the chief manufacturing centre of the country. It is situated on the Save and has a population of 185,000. It is connected by railways with Belgrade, Split and Fiume. *Split* is situated on the Adriatic coastlands and is a very important port. *Kotor* and *Susak* are two other ports. *Fiume,* though under Italy, is the natural outlet for the north-west of Yugoslavia.

Turkey in Europe

European Turkey is about half the size of Scotland, and lies between the river Maritza and the Black Sea. The Straits of Bosphorus and the Dardanelles and the Sea of Marmora separate it from Asiatic Turkey. Its area is only 11,000 square miles and it contains nearly two million people. The situation of Turkey is of immense political and strategic importance, for it provides a route from Russia to the Mediterranean.

During the seventeenth century the Turkish Empire in Europe included the whole of the Balkan peninsula, Rumania and Hungary. Towards the close of that century the power of the Turks began to decline. The Empire was broken to pieces after the last Great War, and to-day European Turkey is but a slice of the Turkish Republic which has its centre in Asia.

The northern and southern sides of Turkey in Europe are bounded by hills, while the east is a plain. Agriculture and sheep-rearing are the two main occupations. The people are conservative and poor.

Istanbul (Constantinople) is the largest town of the Republic. It occupies a very important position "where the shipping routes between the Mediterranean and the Black Sea are crossed by the land route between Europe and Asia Minor". Its importance has declined a great deal since it is no longer the capital of Turkey. The population of Istanbul exceeds 500,000.

Gelibolu (Gallipoli) is a natural naval station, guarding the Dardanelles.

Soviet Union is a gigantic country but it has no outlet to an open, warm sea. The Straits will give a passage to and from the Black Sea for commercial and naval ships. "Passage through the Strait is important to Russia for geographical reasons because all important Russian rivers flow south and because the Caspian and the Black Seas, except for the Straits, are landlocked."

Great Britain is interested because she wants to maintain the safety of communication lines with her Empire in the East, to insure the security of the Suez Canal and to protect her economic interest in the Middle East.

This guards 200 mile sea passage between the Black Sea and the Mediterranean Sea. The Straits are suitable for vessels of every type. Along with the Suez and the Panama Canal, this route is one of the most important water-links in the world. The Straits have great commercial and strategic significance because no other water transit route exists between the Black Sea and the Mediterranean. Both Great Britain and Soviet Union are vitally interested in the Straits.

The Netherlands

The Netherlands is one of the smallest of European countries. It has an area of 12,579 square miles with eight million people. The density of population is 687 per square mile, being second highest in Europe. It is a lowland country and one-fourth of the land is actually below sea-level. About forty per cent. of Holland consists of reclaimed land. Embankments or dikes have been constructed around the low-lying areas of the coast. Polderland or the reclaimed land is very valuable for agriculture. Before the present War a new project for the reclamation of part of the Zuider Zee was under way. This reclamation project was calculated to make available over 8,000 square miles of polders.

The density of population is very great,—more than 659 per square mile. In respect of density per square mile Holland ranks fourth in the world.

The main drainage of the country consists of the rivers, Waal, Lek and Yessel. The coast-line is greatly indented.

The character of both the coast and the surface has made the Dutch essentially a commercial people. The Dutch migrated to different parts of the world and acquired rich tropical colonies. Three centuries ago Holland was considered a principal maritime power.

The climate is generally maritime and can be compared with that of eastern England.

Agriculture is highly intensive and more than seventy per cent. of the land is under cultivation. The principal agricultural crops are oats, rye, wheat, barley, flux, sugar-beet and potatoes.

The ailuvial origin of the soil accounts to a large extent for the absence of minerals in the country. A little coal is found at Limburg in southern Holland.

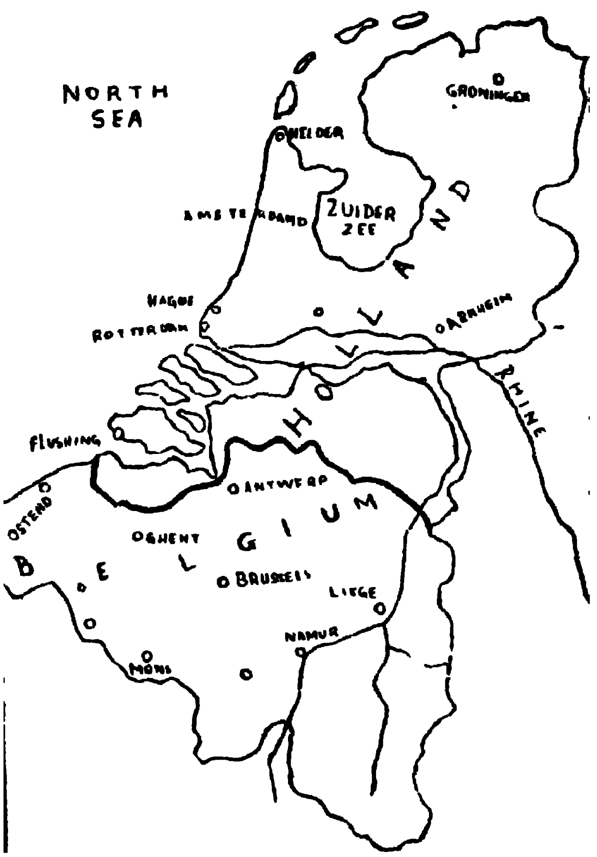

FIG. No. 57. The Netherlands and Belgium with their trade centres and ports.

The industries of Holland are those which (*a*) require less raw materials or fuel but much skill, (*b*) are the direct outcome of agriculture, and (*c*) are based on colonial imports.

The outstanding industry is dairying and the manufacture of milk products. The fertility of the soil, combined with the humidity of the climate, makes the country an ideal region for dairying. ***The Netherlands has more cattle per square mile than any other country in the world.*** Cheese, butter, condensed and powdered milk are extensively made. The development of dairying has led to the neglect of home production of cereals for food. At present there is a large import of bread food for the people and cake for cattle. The Dutch depend to a large extent for their prosperity on dairy industries.

The other industries are fishing, chocolate and tobacco manufacturing and diamond cutting. The flat surface of the country below the sea-level makes it convenient to use wind-power in mills and factories.

Because of the level surface transport is easy in all directions. Water-transport is everywhere more important than transport by rail or road. Holland has more than four thousand miles of waterways provided by the rivers and canals.

The country has a large entrepot trade. Its mercantile marine ranks eighth in the world. The principal exports are condensed milk, cheese, butter, etc. and imports consist of coal, textiles, machinery, etc. Holland's chief purveyor is Germany, which provides more than 25 per cent of the total imports while her chief customers are the United Kingdom and Germany. Other important trade partners are her neighbour Belgium, the United States, Argentina (as an importer only) and the East Indies.

Amsterdam, the largest city, is the capital of the kingdom. It is situated on the west side of Zuider Zee and is linked with North Sea by a canal. The city has a large trade with East Indies and imports rubber, cocoa, tin, rice, spices, tobacco, copra, etc. It is famous for diamond cutting and polishing.

Rotterdam is the principal port of Holland. It is situated on a distributory of the Rhine and is connected with the sea at the Hook of Holland by a canal known as the "New-waterway". It is the natural outlet of the Rhine basin. The port handles three-quarters of the Dutch trade. The principal exports are flax, linen, dairy produce and cattle. The imports include rice, sugar, indigo, coal and petroleum. Rotterdam has a large trade with Germany and East Indies. *The Hague* is the seat of the Government. Its principal industry is pottery. It is a city of great international importance. The other centres are *Utrecht, Haarlem* and *Flushing.*

Belgium

Belgium is one of the smallest states of Europe. It lies between Holland and France and has warm summer and cold winter.

Northern Belgium is a plain and consists of coastal lands. The coast of Belgium is about 40 miles long and is regular. A region of about 10 miles wide immediately to the south of the sandy shore is "polder"-land (reclaimed marshland) which has become famous for agriculture. Flanders in Northern Belgium is a region of plains with low hills. It has the largest proportion of cattle in Belgium and various industries have developed here. *Central Belgium* is an extension of the fertile plains and coal-fields of northern France. This area includes the basin of Scheldt and the Campine region near the Dutch frontier. Central Belgium is a great agricultural region ; mining centres are also growing. *Southern Belgium* is formed of the highlands of the Ardennes which continue into Luxembourg.

Belgium is an extremely densely populated country. The population exceeds 8 millions. The population density per square mile is the highest in Europe, being 712. In Flanders in the north, the density is as high as 990 per square mile. To ensure a high standard of living for such a dense population the country was forced to become industrialised in the middle of the nineteenth century. Its various industries are favoured by mineral deposits and by extraordinary facilities for commerce—both foreign and internal. The facility for commerce is great as the country lies near the focus of great ocean trades and touches three leading commercial nations—France, Germany and Holland, and is close to England. It is situated near the mouth of the Rhine, the chief commercial river of the continent.

Though Belgium is highly industrialised, agriculture occupies a leading position owing to the number of people it employs, the amount of invested capital and the value of its products. Space for cultivation covers approximately 60 p.c. of the territory surface. Agriculture in Belgium is scientific and intensive, but production falls short of demand. Dairying is important in the farm-economy of the country. The country has considerable mineral wealth like coal, iron and zinc. Coal is found in proximity with iron-ore in the north-west of the country, where a great iron and steel industry has developed. The chief centres of the industry are Mons, Charleroi, Namur and Verviers. During recent years a few coal-fields have been discovered in the north-east of the Lys basin. In the production of zinc, Belgium ranks third after the U.S.A. and Canada. Owing to the mining richness of her colonies, Belgium also obtains considerable quantities of copper, lead and tin.

Belgium is a great manufacturing country. It emerged from the World War II with little major damage to its industry. In 1947, the industrial output was 93 per cent of the pre-war level.

She cannot offer her agricultural products to international markets. Nor can she meet the needs of her population so far as food products are concerned.

BELGIAN PRODUCTION (000 metric tons)

	1936-38	1947		1936-38	1947
Cast Iron ..	261	235	Cement ..	250	217
Pig Iron ..	253	235	Coal	2425	2033
Steel	204	211			

The recovery has been uneven as some of the industries are handicapped by shortage of skilled labour and use of obsolescent equipment. The textile industry plays an extremely important part in the industrial activity of the country. Its works include every known kind of textile fibre like cotton, wool, flax, jute and rayon. The cotton industry is the most important branch of the Belgian textile industry by the number of its spindles and looms as well as the number of workers employed. Cotton blankets are in great demand by foreign markets. Cotton carpets also contribute towards the export trade. The woollen industry is the oldest branch of the textile industry. Its centre has recently moved towards the eastern part of the country where water is found which possesses the special qualities for the washing of this textile. Ghent, Antwerp and Courtrai manufacture cotton goods and Verviers woollen goods. Linen manufacturing is very important in Ghent, Courtrai, Roulers and Tournai. Owing to the quality of Belgian flax, this industry enjoys a universal reputation. The growth of this industry has been helped by the following factors: (*i*) the inherited skill of the weavers in spinning and weaving, (*ii*) large supplies of flax in central plains and (*iii*) supplies of coal from the Belgian coal-field. The Belgian steel production is about 2 per cent. of the world's production. The main groups of products from this industry are moulded steel, sheet iron, railway materials, ship building, automobiles, machine tools, metallic building accessories and so on. In 1947, export figure for the metal manufacturing industry amounted to 15 p.c. of the total annual exports. The other industries are chemical industry, glass industry, ceramic industry, leather industry and rubber industry.

The means of communication by land, air and rivers are excellent and serve commerce extensively. Situated at the cross-roads of Western European nations, Belgium has a railway system of 6000 km. of railway tracks connecting the main points of the continent. *Brussels* is the centre of the railway system. The rivers are navigable and connected with one another by canals. The Belgian air-line system has branches throughout Europe.

The country has a large trade with the neighbouring countries like France, Germany, Holland, England and Denmark. It has also trade relations with the U.S.A., Canada, Argentine, Australia and Africa. The imports consist of, in the order of their importance, grain, iron ore, mineral oil, wood, wool, cotton, copper, phosphate, coffee and other colonial produce. The chief exported goods are iron and steel products, coal and coke, chemicals, manures and so on.

Brussels is the capital and is situated on the River Senne. Its excellent situation—halfway between the coal-field and the sea—has made it a great trade centre. Lace, carpet, furniture and paper are made. It is connected with Antwerp by a canal and railway.

Antwerp, at the Scheldt estuary, is the greatest port of Belgium. It has a large entrepot trade and competes with Hamburg and Rotterdam. Its hinterland includes part of Eastern France, the Rhine valley and the Ruhr valley, in addition to Belgium proper. It is also a great industrial centre. *Liege* is situated in the heart of the Belgian coal-field. It is noted for chemicals, glasses and metal works. *Ghent* is the great linen-manufacturing centre. *Verviers,* in the Southern Highlands, is noted for woollen goods.

The principal exports of Belgium are iron and steel, glass, cotton goods, zinc manufactures and cement.

EXPORT IN P.C. OF TOTAL VALUE (1947)		IMPORTS IN P.C. OF TOTAL VALUE (1947)	
Manufactures	54	Food-stuffs	21
Raw materials	39	Raw materials	49
Food-stuffs	6	Manufactures	28

Luxembourg is the smallest independent state in Europe. It has an area of 999 square miles with 295,000 inhabitants. Most of the people of Northern Luxembourg are engaged in agricultural and pastoral occupations. Southern Luxembourg is famous for its iron deposits. It produces annually 3 million tons of iron and 2,500,000 tons of steel. The products are mostly exported to Germany and France. Commercially, it has been united to Belgium since 1921.

Denmark

Denmark has an area of about 17,000 square miles and lies seventy miles south from the coast of Norway. Its area is one-tenth the size of Sweden and one-eighth that of Norway. It consists of the north-pointing peninsula of Jutland and many islands of which Funen, Zealand and Laaland are the principal ones. Jutland takes up two-thirds of the area of the country. The country has plains and low hills ; no part of the country has an elevation of more than 550 feet. The situation of the country is particularly important as it controls, the natural routes between the North Sea and the Baltic Sea. The west coast of Denmark is a line of dunes with sandy beaches and much surf and therefore this part of the country is very sparsely populated. But the Baltic side is fertile and more people live here. The total population of Denmark was 5 million in 1945. The Danish population is homogeneous. All the inhabitants speak the same language and follow the same Church.

The resources of Denmark are limited. It has no minerals except Kaolin which is used for the manufacture of pottery.

The rivers are not important either for navigation or for developing hydro-electricity. It has no lumbering industry as agriculture has displaced the forests which at one time covered a great part of the country and has made Denmark one of the countries in Europe most deficient in forests.

Denmark has always been an agricultural country. At one time it was a great producer and exporter of wheat ; but after 1870 the importation of American wheat into Europe greatly curbed this activity and caused the Danish peasants to abandon agriculture for stock-raising. The agricultural area represents 75 per cent. of the total area. The grains and other crops are grown for the live-stock production. About 88 per cent of the harvest is used for feeding cattle, horses, pigs and fowls.

Denmark is the pre-eminent dairy-farming country of the world. The keeping of milch cows and milk production is the backbone of Danish agricultural industry. So far it is the key industry for the economy of the community ; and through this product exchange of goods with other countries is made. The following factors have given Denmark its pre-eminence as a dairying country : (*i*) The absence of resources to form the basis of a great manufacturing industry. The country has no coal, no iron, no water-power and no raw materials. (*ii*) Its climate favours the production of grass and root crops. (*iii*) "Most of the farms are small so that each family must obtain a large yield from a small area of land." (*iv*) "Denmark has perfected the system of the utilization of arable land to produce food-stuffs for cattle ; by this method more cattle can be kept than on the same area of pasture and meadow-land." But *Denmark's success in dairy-farming is mainly due to co-operation.* 88 per cent. of the dairymen belong to co-operative societies, and 92 per cent. of milk is handled by the same association.* The aim of the co-operative dairies of Denmark has been to produce a standard quality good enough to gain the confidence of the buyers. The Government also maintains a strict system of inspection both of the farms and of the export products. At present there are nearly 9,000 co-operative societies in the country. Eighty per cent. of milk is used for making butter and ten per cent. for cheese and condensed milk, the rest is consumed locally.

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* This development of co-operation which is not the result of any Government compulsion is mainly traceable to the unusually high level of adult education.

DAIRY PRODUCTION IN DENMARK

Year		Milk (million gallons)	Butter (thousand cwt.)	Cheese (thousand cwt.)	Eggs (thousand great hundred)
1935-39*		1,128	3,580	650	17,100
1945	..	914	2,600	870	7,600
1946	..	984	2,780	1,020	8,100
1947	..	879	2,460	900	8,800
1948	..	868	2,380	1,100	13,600
1949	..	1,056	3,051	1,207	16,554

The principal exports are dairy produce, vegetable oil products, cement, chalk, fish, live animals and eggs. The imports are bread, cattle food, fruits, drink, sugar, pulp and paper, chemicals, metal goods, textile materials, manufactured textiles, mineral oils, coal and coke.

The dairy produce accounts for 76 per cent. of the value of Danish exports. More than two-thirds goes to England. Seventeen per cent. of Danish exports and 28 per cent. of imports are shared by Germany.

Fishing industry and a large mercantile marine have developed because of the ideal situation of the country. But the prosperity of Denmark will always depend on the ability of supplying provisions to the industrial areas of Western Europe.

Copenhagen is the largest city in the country. It is situated on the east coast of Zealand and contains nearly one-fifth of the population of Denmark. It stands at a crossing of land and sea-routes. The opening of the Kiel canal has affected its trade adversely. Copenhagen is an entrepot for the products that the Baltic lands buy or sell. Textiles, boots and shoes, beer and pottery are the important products. *Esbjerg* is situated on the west coast of Jutland and is an important fishing centre. *Aarhus* and *Odense* are the two other largest towns on the eastern side of the country.

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* Average of 1935, 1937, 1938 and 1939.

Scandinavia

The Scandinavian peninsula is the largest in Europe and contains Norway and Sweden.

NORWAY is a long narrow country forming the western portion of the Scandinavian peninsula with an area of 125,000 square miles. In spite of its northerly position the coasts of Norway are always ice-free. It is because the warm surface water is drifted across the Atlantic Ocean against the whole Norwegian coast. The coast-line is extensively indented with fjords and fringed with a large number of rocky islands. The fjords —long, narrow, steep-sided indentations—are drowned valleys. At many places fjords sides rise almost perpendicularly from the sea for several hundred feet. The streams form magnificent waterfalls.

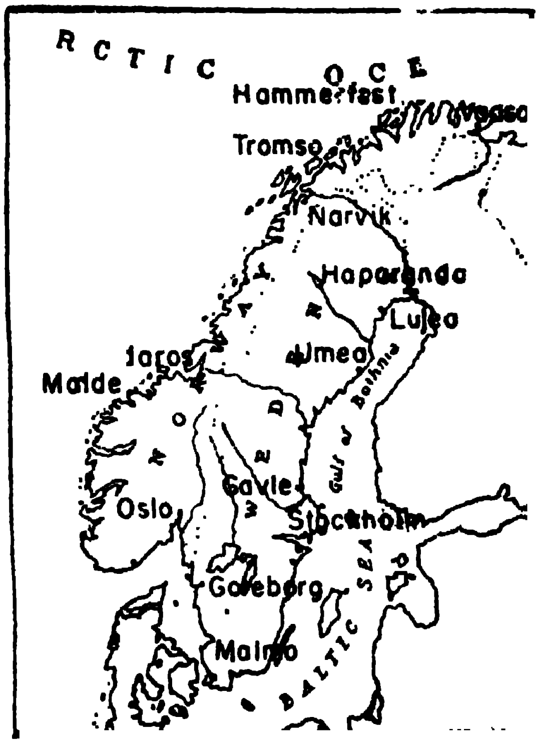

FIG. No. 58. Scandinavia

More than two-thirds of the country is entirely unproductive. Lakes and rivers occupy 5,111 square miles and the forests include 26,000 square miles. Only 3·6 per cent. of the total area of Norway is under cultivation.

The population of the kingdom is nearly three millions (2,814,000) and the average density of population is 23 per square mile. The south-eastern part of the country is densely populated. The major occupations of the people are concerned with agriculture, fishery, forestry and manufacture.

Cultivation is limited to the sheltered lowlands of the south-east. In spite of this limitation more than 31 per cent. of the population depends on farming, the greatest single industry in the country. Wheat, oats, barley, rye and potatoes are the chief crops. In recent years dairying has developed considerably. More and more the farmers are giving up the growing of cereals for dairying and already some dairy products are being exported.

Fishing is a very important industry of the country. The principal catches are cod and herring. "The greatly indented coast with its long line of protecting islands provides numberless harbours for the fishermen and good spawning grounds for the fish." Cod is found around the Lofoten islands and Finmark in the north, while in the south of Stavanger and Haugesund herring is abundant. The catches find a ready market in those European countries which have no fisheries. Cod-liver oil and other fish oils have a world market. Stavanger engages in canning fish for the export market ; *Kristiansund* is the centre for the dried cod ; *Bergen* is the chief fishing port. *Hammerfest* and *Tromso* are the centres for northern fisheries.

Although forests cover nearly one-fourth of the total area, the most important region is situated in the south-east. The forest products are very important and constitute about one-third of the total exports. "Large quantities of timber are used in Norway for building and for fuel, but there remains a large surplus. This was formerly exported as lumber, but to-day Norway does not supply much wood to other countries but uses it as the basis of manufacturing industries, such as the manufacture of wood-pulp and paper."

Mineral wealth is not inconsiderable. Iron-ore, copper and silver are the chief minerals. Coal is practically absent. *Spitsbergen* in the Arctic has certain coal mines. Iron ore is found in the far north on the border of Finland. The old rocks of the mountains contain fine granite.

"The country has developed shipping greatly and the Norwegians are among the great shippers of the world." Norway's merchant marine ranks fifth in the world and consists chiefly of tramp steamers. "The geographical position of Norway, its numerous good harbours, the facilities for building wooden ships, the ease by water and difficulty by land with which communication is carried on, the exportation of timber and fish and the importation of coal, cereals and manufactured goods, have all contributed to the growth of Norwegian shipping."

Industries in Norway are mainly based on raw materials raised within the country and on water-power. Norway offers unique opportunities for the development of hydro-electric power. There are many waterfalls, and rivers are swift-flowing and do not freeze in winter. Wood-pulp, paper and matches are manufactured with the help of hydro-electricity.

Many people from different parts of the world come to visit the scenery of Norway and the money spent by these visitors is a considerable source of income to the country.

The mountainous nature of the land and the great distances from north to south are responsible for the meagre development of the means of communications. The roads and railways are mostly confined to the south-east of the country. Most of the foreign trade is carried on with the European countries. Timber, paper, fish, matches, dairy produce and tinned provisions are the chief exports. The imports include rye, flour, coal, machinery, sugar, coffee and barley.

Norway is a leading supplier of printing paper to India—almost 25 per cent. of the total annual imports being obtained from that country. The total value of imports of print paper from Norway was Rs. 1·26 crores in 1947-48, Rs. 2·24 crores in 1948-49 and one crore of rupees in 1949-50. The total value of imports of paper and paste-board, including paper making materials, amounted to Rs. 1·69 crores during 1949-50, and accounted for about 70 per cent. of the total imports from Norway during that year.

The total value of imports of calcium carbide, the second largest item, amounted to Rs. 29 lakhs. The other principal items were metals and ores (Rs. 12 lakhs) ; cement (Rs. 9 lakhs) ; staple fibre and yarn (Rs. 6 lakhs) ; dyeing and tanning substances (Rs. 5·5 lakhs) ; toys (Rs. 2 lakhs) and machinery and millwork (Rs. 1·96 lakhs).

As regards exports from India, jute manufactures, cotton, raw and waste, oilseeds, coir-yarn, lac and manganese constitute the major items. In 1949-50, oilseeds topped the list, total exports of this item being valued at Rs. 44 lakhs. The total value of export of jute manufactures was placed at Rs. 21 lakhs and that of cotton, raw and waste, at Rs. 12 lakhs. These three items together accounted for more than 75 per cent. of the total exports during 1949-50. Among other items of export, the principal ones were castor oil (Rs. 3·7 lakhs) ; manganese ore (Rs. 2·8 lakhs) ; coir yarn (Rs. 2·6 lakhs) and tea (Rs. 2·16 lakhs).

Oslo is the capital and has 250,000 people. It is situated at the head of *long fjords* in the south-eastern lowland of Norway.* It is connected by railway with Bergen and Trodhjem. *Bergen,* the second largest town, exports large quantities of fish to the European countries. *Trodhjem,* the northerly railway centre, exports herring fish. It was the ancient capital of Norway. *Narvik* is an important port of Norway in the Arctic Ocean. It is connected with the Swedish railway system. During winter the iron-ore of Sweden is sent to Narvik by railway as the Gulf of Bothnia is ice-bound at this time.

SWEDEN occupies the eastern portion of the Scandinavian peninsula. Most of its coast-line faces the Baltic which is frozen during the winter months ; the coast-line is not much indented. The climate is continental. Plains and lowlands cover the southern side, while the north is mountainous.

The area of Sweden is 173,000 square miles ; over half of it is forested. Although it is smaller than Norway in size, the area of its productive land is greater. The population is about 60·8 million.

Sweden presents four distinct geographical divisions:

(*i*) Norrland,
(*ii*) The lake district,
(*iii*) The plateau of Smaland,
(*iv*) Scania.

Norrland is the northern part of Sweden and represents about 60 p.c. of the total area of the country. It is a region of very recent colonisation. Immediately to the south of Norrland is a lowland, the *lake district,* which is highly developed both agriculturally and industrially. *Smaland* occupies the central area of Southern Sweden. It is an area of forests, swamps and moorlands, and the population is very sparse. The extreme south-west of Sweden, known as *Scania,* is the richest agricultural region in the country.

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* It is a curious fact that Norway's capital in its shape and situation looks like India. Its southern portion forms an irregular triangle stretching down into the Christiana Fjord—its Indian Ocean.

The mineral wealth is considerable. The iron deposits of Sweden are the most famous in the world for quality. High grade iron-ores exist at Kiruna and Gellivara in Northern Sweden. Almost the entire production is sent to Germany and England: 33 per cent. *via* Narvik and 65 per cent. by way of Lulea.* It must be noted that Sweden raises only 5 p.c. of the world's total iron-ore.

The country is poor in coal. Recently great progress has been made in water-power. The greatest hydro-electric power station is situated at Porjus, which supplies power to railways and industries. Copper, silver, lead, zinc and sulphur are also found. The gold deposit at Boliden (in Norrland) yields some 2 per cent. of the world's output.

In no other country of the world are forests so important for national prosperity as in Sweden. Forests and the existence of sulphur within easy reach give Sweden a prominent place in the match-making industry. *Jonkoping* in Smaland is a great centre for the manufacture of matches, which are produced in immense quantities and exported to every part of the world.

Only 9 per cent. of the land is under cultivation. The Scania peninsula raises wheat, barley and rye. Sugar beet is also cultivated. The country is more or less self-sufficient.

Nearly half a million people are engaged in industries. Mining, lumbering and paper-making are the principal industries. The chief exports are paper and paper-pulp, logs and lumber, metal and ores. The imports include coal, textile goods, food-stuffs and machinery. Sweden receives most of her imports from Germany, and sends most of her exports to the United Kingdom.

Stockholm is the capital of Sweden and contains 600,000 people. It is a great industrial and railway centre. Located as it is on the eastern side of Sweden, it is away from the main trading routes. Moreover, access to Russia is hindered during winter as the Gulf of Finland is ice-bound. *Goteborg* is the great trading centre of the country. It is situated on the west of southern Sweden. It is ice-free and has excellent canal and railway communications with all parts of southern Sweden. Its population in 1947 was 326,000.

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* During the winter months, when the Baltic is frozen, ores are exported through Narvik in Norway. Narvik is connected with the Swedish railways.

Iberian Peninsula

The Iberian Peninsula, which includes Spain and Portugal, is situated on the south-western side of Europe. Its position is admirable for commerce, but the character of the coast and the shore-water have retarded the development. The coast is very regular with few harbours, and the sea currents are violent, making it almost impossible to construct harbours.

SPAIN. It is a backward country in commerce and industry. The excellent situation for commerce, the high fertility of the land and the vast mineral resources are of no use at present to the country because of certain drawbacks.

(*i*) Although her iron-deposits are vast, she lacks the fuel to establish her iron industry.
(*ii*) Her harbour accommodations are inadequate for shipping. Due to the character of the coast-line, sheltered harbours are practically absent.
(*iii*) The country is mountainous ; the difficulty of building roads and railways is considerable. Rivers are swift and have rapids and falls.
(*iv*) The climate, though Mediterranean, is not generally conducive to health and efficiency.
(*v*) Large estates are owned by the aristocracy, and the common people are very poor.
(*vi*) Absence of trade organisations accounts for the decline of export trade in wheat and wool. At one time Spain was a large exporter of these materials.

Spain is essentially an agricultural country. The area of land devoted to agriculture is less than 40 per cent. of the total area, and only 7 per cent. of the cultivated land is irrigated. Further progress in irrigation works is necessary. Now that internal disturbances are almost over, the Government has initiated a programme for agricultural development.

Nearly one-fourth of the population is engaged in agriculture. Wheat, rice and fruits are extensively raised. Spain ranks first in the world in the production of olive oil and cork, and in the exportation of oranges. Pastoral industry is also important. Cattle, sheep, horses and pigs are reared. Spain has always been famous for the wool of its merino sheep.

In no other country in Europe is the mineral wealth so varied and widely distributed as in Spain. Iron-ore, manganese, zinc, lead, coal, copper, mercury, silver, etc. are found. *It ranks first in Europe in the production of lead and copper, second in mercury and silver, and among the first in zinc, manganese and iron.* Spain provides about 40 per cent of the world's output. of mercury. Hydro-electric power has been developed in the Pyrenees.

The means of communication are very inadequate. There are only 9,000 miles of rail-roads, while Belgium has 6,000 miles on an area one-sixteenth as large. Rivers are useless for navigation, nor are they utilised for irrigation.

Spain is the third largest wine-producing country in the world. The chief manufactures are textiles, wine, hides and skins, dairy produce etc.

The principal exports are fruits, iron, cork, wool and esparto grass. The imports include machinery, textile goods and food products.

Madrid, the capital, has a population of nearly 1 million. It is the principal railway centre. *Barcelona,* on the Mediterranean coast, is the largest city and the premier port of Spain. It is a great industrial centre. The other trade centres are Valencia, Malaga, Bilbao and Cadiz.

PORTUGAL is a small maritime country to the west of Spain, with a population of nearly 10 million. The climate is mild and moist. The soil is fertile. The country forms a natural outlet for the Atlantic trade of Spain. The main industry of the country is agriculture and 60 per cent. of the inhabitants are engaged in it. Lemons, figs, oranges, apples, almonds, dates and nuts are extensively grown. Wine is made throughout the country.

The country is rich in minerals. Iron-ore is considerable. Tin and wolfram are worked with foreign capital, the deposits of wolfarm being the most important in Europe. Copper, lead and salt are also obtained in large quantities.

The forests of Portugal are specially important for oak from which cork is obtained. Lack of fuel is responsible for her slow progress in industries. The country has negligible quantities of coal and the development of hydro-electric power is equally meagre. The manufacturing industries are mostly those connected with the preparation of products obtained from vines and olives. There are also considerable woollen, cotton and linen industries. *A characteristic occupation of the Portuguese is the manufacture of porcelain tiles, an industry inherited from the Moors.* Cork is exported enormously from the country.

Lisbon is the capital and chief port. It has a magnificent harbour. It is connected by rail with Madrid and Oporto. Agricultural products are exported and manufactured goods are imported through Lisbon. *Oporto* is the chief port through which wine is exported.

Great Britain

Great Britain is the most highly industrialised country in the world. The commercial and industrial development of Great Britain was remarkable from the latter half of the nineteenth century. She was the leader in engineering development, the pioneer in railways and the inventor of a great number of industrial processes. By 1900 Great Britain alone accounted for about one-fifth of the total world trade, while Great Britain and the Empire together accounted for nearly one-third. (*She possesses certain natural and physical advantages which have greatly contributed towards the remarkable growth of her commerce.*)

1. The climate of the British Isles, on the whole, is mild and equable. The mildness of winter causes little or no interruption to agriculture, and its comparative freedom from heavy snow-fall causes little interruption of communication. "The climate is neither so hot nor so cold as to prevent people from working either in field or factory throughout the year. The British capacity for regular routine work, so necessary in the manufacturing industries, is partly the result of climatic conditions."

2. The coast-line of Great Britain is broken up by numerous inlets, so that no part of the country is more than 70 miles from navigable water or more than 100 miles from the sea. The British Isles have one mile of coast to thirteen square miles of area. The nearness of the coast, on both sides, places a manufacturing region within easy reach of many markets.

3. The situation of the country is very important. The English Channel has separated the country from the Continent. The United Kingdom is, on the one hand, very near to Europe for the purpose of commerce, and, on the other hand, it is too far away from Europe to be invaded easily by land or sea, although it does not enjoy equal immunity from aerial attacks. The country is, moreover, centrally situated—no part of the world is far from her. The great industrial countries of the Continent—Germany, France and Belgium—face her eastern and southern coast; while the U. S. A. can be easily approached by the Atlantic Ocean. Another advantage of the situation of the British Isles in shallow seas on the European continental shelf is that it gives the benefit of high tides in flooding the harbours, keeping them free from silt and waste and in bringing ships far up the estuaries.

4. The country is very fortunate in having large deposits of coal and iron. Coal is of superior quality and is found close to iron-fields. All the principal industries of Great Britain are more or less localised near the coal-fields. Chalk, slate, tin and clay are also found in small quantities. The rivers of the United Kingdom are of little use for navigation; but their estuaries are always important for shipping.

The rapid commercial and industrial progress is also due to economic and human factors. (1) The essential political stability of the country's democratic parliamentary Government made industrial progress rapid. (2) The temperament, character and industry of her people are the real strength. The industrial output per head of her population is one of the highest in the world. Great Britain is even today the traditional home of outstanding technical achievement. Because of the industrial skill of her people, she enjoys world-wide reputation in the matter of superiority of design in textiles, pottery, aero-engines and ships. (3) Internal communication is perfect. Great Britain has 25,000 miles of railways which serve all the great ports of the country. The road-system is also excellent, and motor-transport handles both passenger and goods traffic. The inland waterways are,

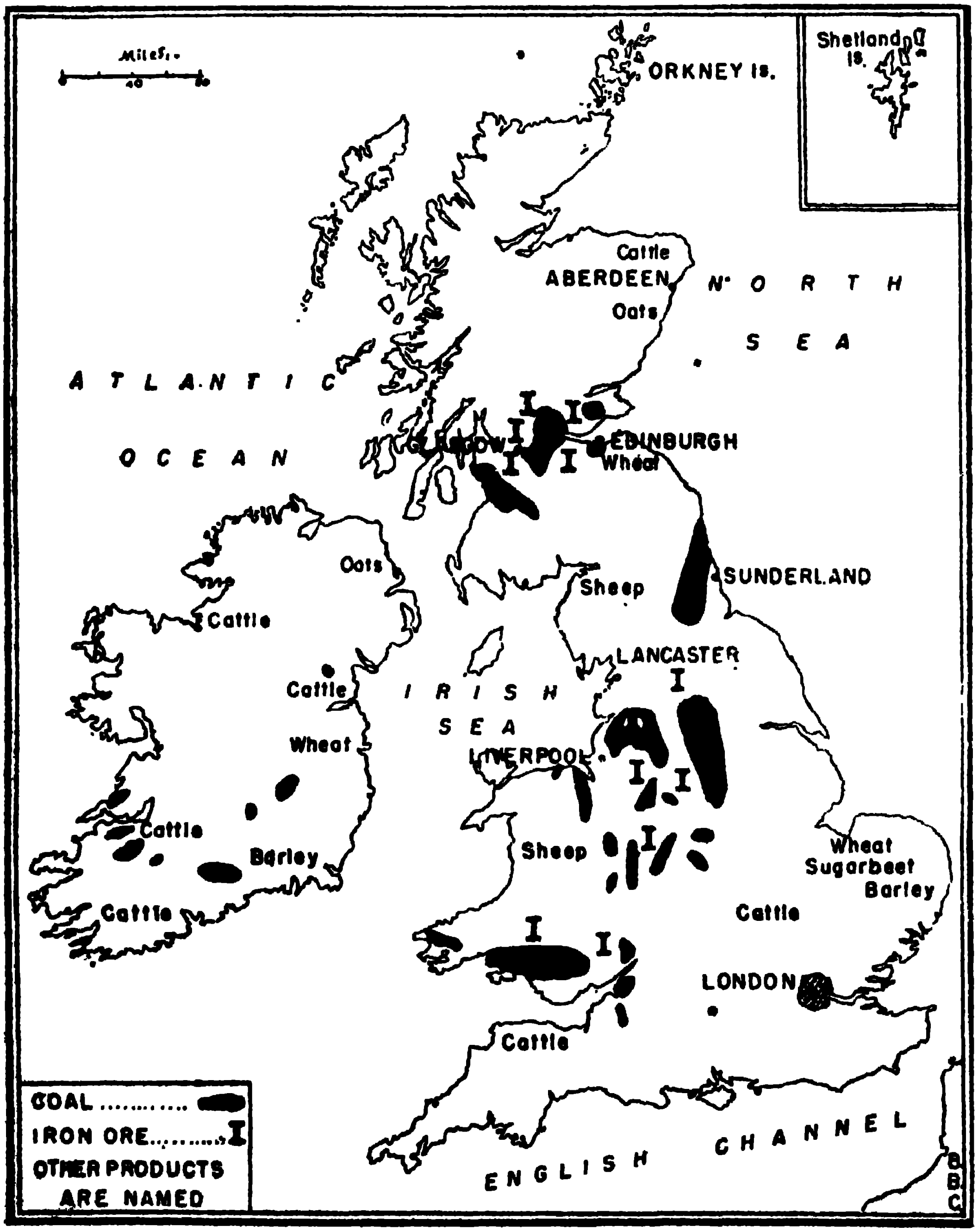

FIG. No. 59. Economic products of the British Isles.

however, not very important, and they carry about 4 per cent. of the traffic handled by the railways. In 1947 an Act was passed to set up in Britain a publicly owned system of inland transport. A Board has been established in January 1948 with general powers to carry goods and passengers by road, rail and inland waterways, to provide port facilities etc. and to extend and improve the system. The system which has thus passed into state control is now the greatest unified transport system in the world. The Board owns railways, 20,000 locomotives, 41,000 passenger vehicles, 1,235,000 wagons, 100 steamships and many thousands of motor vehicles. (4) Population is large in industrial areas. (5) Colonies and dependencies are extensive, which provide vast markets for the British goods. The British Commonwealth of Nations and Empire contain more than 24 per cent. of world population.* (6) Her mercantile marine is the biggest in the world. (7) English language has spread throughout the globe. In addition to these contributory causes, the free trade policy that prevailed in the country in the last century and the great mechanical inventions are also to be taken into consideration.

But there are certain disadvantages as well. The dearness of land arising from the density of population and the great development of industry, high wages of the labourers and the deficiency of water power are giving anxieties to the British industrialists. The high tariff of other countries of the world is affecting adversely the trade of the British Isles to a great extent.

Great Britain is not fortunate as the possessor of the essential raw materials of industry. She has of course still the deposits of valuable coal and low-grade iron-ore, but these are no longer the only key materials of an industrial economy. Indeed, no other great industrial country has so few of the raw materials. The following table will show her dependence for basic raw materials and minerals on other countries.

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* They include : (*i*) Gibraltar, Malta, Gozo and Cyprus in Europe; (*ii*) Port Said, Aden, Perim and Socotra Islands, Indian Union, Pakistan, Burma, Ceylon, Straits Settlements and Borneo in Asia; (*iii*) Australia, New Zealand, a part of New Guinea, Fiji and Solomon Islands in Oceania; (*iv*) Zanzibar, Pemba, Kenya, Uganda, Tanganyika, the Sudan, Siera Leone, the Gold Coast, Nigeria, Gambia, British South-West Africa, Mauritius, Union of South Africa, Rhodesia, Bechuanaland, Basutoland, Swaziland, Nyasaland, etc., in Africa; (*v*) Canada, Newfoundland, Labrador, the Bermudas, Jamaica, the Bahamas, British Guiana, Trinidad, Falkland Islands, etc. in America.

PERCENTAGE OF WORLD OUTPUT OF BASIC RAW MATERIALS PRODUCED AND USED IN GREAT BRITAIN (1938)*

Raw material	p.c. of world output produced in Great Britain	p.c. of world output used by Great Britain
Coal ...	... 18·9	15·5
Iron ...	... 4·8	11·5
Petroleum	... —	4·5
Nickel	... —	27·0
Manganese	... —	9·5
Tin ...	... 1·3	35·0
Cotton	... —	10·0
Wool ...	... 2·7	2·0
Rubber	... —	15·0
Bauxite	... —	5·5
Lead ...	... 1·6	20·5
Zinc ...	... 0·6	7·5
Copper	... —	13·5

Population. The United Kingdom is a very densely populated country. The estimated total population of the United Kingdom in 1949 was 50·5 millions. It had increased by over a million since 1944, by nearly 3 million since 1939, by six million since 1921 and by about 43 million since 1700. The main causes of this increase were a steady reduction in death rates and a continued high birth rate until the beginning of the 20th century.

The average density of population in England is 685 per square mile. *With the exception of Belgium, Holland and Java this is the highest density of population recorded for any country.*

Northern England and South Wales are the centres of the densest population, because these are the industrial areas.

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* Great Britain—the world's best customer—Ministry of Information, London, 1945.

Recently population in Southern England, particularly in the suburbs of London, has increased with great rapidity. Lancashire, Glamorgan, Warwickshire, Durham and Staffordshire have more than 1,000 people per square mile. The industrial activities of these regions attracted people from other parts of the country. The agricultural districts of Norfolk, Suffolk, Lincolnshire and Cambridge contain less than 500 people per square mile. The mountainous districts are all sparsely populated.

Mining. The minerals of Great Britain are highly important.

PRINCIPAL MINERAL PRODUCTS OF GREAT BRITAIN

(In 000 Metric tons) 1949-50.

Coal	215,100	Gypsum	1,092
Iron	14,700	Sand stone	4,346
Lead	38	Lime stone	15,926
Zinc	19	Chalk	10,167
Tin	3	Clay	26,500

The two most useful minerals—coal and iron—are found in close proximity. Coal is found throughout the country in large quantities ; in the annual production of coal Great Britain occupies the third place. The British coal-beds are of carboniferous age and contain coal of bituminous quality The value of several of the British coal-fields is enhanced by their closeness to the sea. Coal is the principal cargo of the coastal trade and forms one-third of the total. The quality of British coal is fairly good.

The coal mining is very important in the national economy of the country. It employs nearly one million people, and about four millions of the population of the country are directly dependent on it. Coal mining accounts for 90 per cent. of the value of the total mineral output of the country. Each major coalfield is an important industrial area. Coal is also important in British export trade, accounting for over 5 per cent. of the total value of the country's exports.

CONSUMPTION OF COAL

(In million tons)

Disposal	1938	1951
Gas work	18·2	27·4
Electricity generating stations belonging to authorized undertakings and to railway and tramway authorities	14·9	35·4
Railway Companies	12	14·3
Iron Works	18·7	8
Collieries	11·8	23·5
Domestic Coal	40·0	61·9
General manufactures and Engineering	57·7	37·4

The principal coal-fields of the United Kingdom are the following :

The Pennine Range

1. Northumberland and Durham. 2. York, Derby and Nottingham. 3. South Lancashire. 4. North Staffordshire.

The Midland Plain

5. Warwick. 6. South Staffordshire. 7. Leicestershire.

The Welsh Mountains

8. North Wales. 9. South Wales.

The Midland Valley of Scotland

10. Ayreshire. 11. Clyde.

Small coalfields are also found in Bristol, Edinburgh and Kilkenny in Ireland.

THE FIGURES SHOWING THE POSITION OF THE BRITISH COAL INDUSTRY.

Year	Output (in million tons)	Exports (in million tons)	Employment (in thousand)
1913	287	98	1,230
1927	251	72	1,037
1933	208	57	797
1939	228	46·3	782
1946	189	9·2	977
1949	214	19	1,016
1950	216	17	—

In 1951 coal output was 222 million tons, of which 211 million tons were deep-mined and 11 million tons open-cast.

The Scottish Coal-fields	... ...	14 per cent.
,, Yorks, Notts and Derby	...	31 ,, ,,
,, Lancashire	... ...	6 ,, ,,
,, Midlands	... ...	11 ,, ,,
,, South Wales	... ...	16 ,, ,,

The South Wales Coal-field is very important in respect of quantity and quality. The coal extracted here is particularly used in steamships. South Wales was the greatest coal-exporting area in the world till 1914. But since 1920 the coal industry of South Wales has been passing through years of great difficulty. The demand for coal has fallen considerably.

Factors responsible for the decline of the Wales coal-fields: (*i*) The high price of British coal. As most of the easily accessible coal-fields have been mined, the workings have now followed the coal structures deep and far underground. *Thus the cost of production has gone up.* Because of the ease with which coal is mined, the U.S.A. is putting cheaper coal in the markets. (*ii*) The rapid development of hydro-electricity. France, Italy, Sweden and other former customers have developed hydro-electric power. (*iii*) The discoveries of new fields. Australia and Natal—once large importers—have discovered many new coal-fields.

Though the coal-field of North Wales is not as large as that of the South, yet the former enjoys a direct sea communication.

The York, Derby and Nottingham coal-field is about 70 miles long and 20 miles wide. This coal-field is within easy reach of the iron deposits. Nearness to sea has helped the growth of export trade. Scandinavia, Denmark and the Baltic States import coal from this area. The woollen industries of the West Riding and the iron and steel industries of Sheffield are particularly associated with this coal-field.

The cotton industry is primarily important in the South Lancashire coal-field.

The Midland coal-field developed because of the iron and steel industry. Since 1929, with the decline of the steel industry, the Midland fields have been passing through difficulties. To-day these fields contribute only 11 per cent. of the U. K.'s total coal.

The Ayreshire coal-field of Scotland raises coal mostly for export. The Clyde estuary does not actually possess coal, but it can very conveniently use the Lanarkshire coal. The great ship-building industry of the Clyde basin is based on the Lanarkshire coal and iron.

In July 1946, **the Coal Industry Nationalisation Act** was passed to bring the coal mining industry into public ownership and control. On the 1st January 1947, the coal mining industry and certain associated activities passed into the control of *National Coal Board* whose duty it is to secure the efficient development of the coal-mining industry and to make supplies of coal available in quantities and in prices which seem best calculated to further the public interest. The National Coal Board is responsible for about 1500 collieries, and some 45 per cent of the coking and by-products' plants of Britain. The Board has become owner of about 300,000 acres of land, 14,000 dwelling houses and a wide variety of workers, plants, mills and every type of transport. It has become the employer of 723,000 workers in addition to a large number of workers engaged in ancillary undertakings. There is urgent need to increase the output of coal immediately in view of increase in home consumption and programme of coal exports to European countries. In 1947, the coal production was 197 million tons. In the same year, 185 million tons were used for home consumption, and 6 million tons were exported. In 1949, the home consumption increased to 200 million tons, and exports to about 20 million tons.

The iron ores of Great Britain are mainly of low grade. The deposits are fairly abundant and are found in North Lancashire, Clyde basin, North Staffordshire and South Wales.

The supplies of South Wales iron-ore have been nearly exhausted and the iron and steel industry of this area now depends on Spain and France for iron-ore. The most important iron-ore field lies in South-East England, which supplies about 85 p.c. of the iron of Great Britain. The principal iron-ore centres are (*a*) in the Cleveland Hills ; (*b*) at Scunthorpe and Frodingham in Lincolnshire ; (*c*) at Corby and Kettering in Northamptonshire ; and (*d*) near Banbury in North Oxfordshire. The iron fields of the U.K. cannot meet the requirements of the metal industry. Iron ore is imported on the grounds of quality and resultant economy. Many of the mines which yielded very rich ores are almost exhausted, and the easily accessible types of ores require a considerable outlay to provide fuel for smelting. Therefore, Britain finds it economical to import a percentage of rich ores from Sweden, Spain, France, U.S.A. and New Foundland. This imported ore is normally haematite. In 1938 the United Kingdom imported 5·1 million tons of iron-ore from abroad.

The other minerals found in the country are lead, zinc, copper and tin. Limestone, chalk, granite, slates and salt are also quarried. Quarrying is an important occupation in Cornwall, Devon, Somerset, Wales and the Cumbrian peninsula. At one time tin was the most important mineral of England ; now it has almost been exhausted.

In the United Kingdom the production of *strategic minerals* is not large, and many of such minerals are absent. But the country has excellent access to those minerals, because of her empire and world-wide trade.

STRATEGIC MINERAL SUPPLIES IN THE U. K.

(Figures based on 1938 production)

	Home production (million tons)	Empire (million tons)	Other sources (million tons)
Coal ...	230	75	15
Iron ore ...	12	10	6
Pig iron ...	7	3	1
Steel ...	10	3	—
Oil ...	—	7	84
Manganese ...	—	950	150
Chrome ore ...	—	170	130
Tungsten ...	—	50	100
Copper ...	—	500	900
Aluminium ...	—	550	850
Nickel ...	—	90	30

Access to these minerals has made the position of the United Kingdom strongest in the world, except that of the U.S.A.

Agriculture. The British Isles is a great manufacturing country, yet the farming activities of its people occupy an important place in the national economy. About 11 per cent. of the total population are engaged in agricultural occupations. In Scotland, it is 3 per cent., in England 2 per cent., while in Ireland 53 per cent. About 80 per cent. of the land area of the United Kingdom is used for agriculture today.

USE OF AGRICULTURAL LAND

(Million acres)

	1939	1950
Wheat	1·8	2·5
Barley	1·0	1·8
Oats	2·4	3·1
Mixed corn	0·1	0·8
Potatoes	0·7	1·2
Sugar beet	0·3	0·4
Vegetables	0·3	0·5
Arable Land	12·9	18·4
Permanent grass	18·8	12·8
Total crops and grass	31·7	31·1

Land being dear and limited in the U. K., the method of cultivation is always intensive. Wheat, barley, oats, sugar beet and fruits are cultivated in those parts where climatic conditions are suitable. In Eastern England the geographical conditions are exceptionally favourable to the growth of these products. Summers are hot, and, therefore, wheat is cultivated in Lincoln, Norfolk, Suffolk, Essex and Bedfordshire. Barley requires conditions similar to those for wheat, so it is also cultivated in the eastern plains. Oats are raised in the eastern plains of Scotland and in the low land areas of Northern Ireland. Sugar beet is cultivated in (*i*) the wheat lands of Eastern England, (*ii*) North Shropshire and the neighbouring countries, (*iii*) Fifeshire, and, (*iv*) the valley of the river Barrow in south-east Ireland.

In 1949 Great Britain produced only 39 per cent. of the food she needed. For nearly a century, she has been far and away the greatest importer of food in the world. The economy of great areas of the earth's surface has been based on Great Britain's ability to absorb large quantities of primary products. As a consumer of food, she has always played a major role in the economy of the primary producers.

During 1939-45 as a result of the shortage of imported foodstuffs, the country paid great attention to the extension of agricultural fields. Many gardens and wastelands were converted to arable lands so that by the end of 1944 more than 6·5 million new acres had been ploughed up.

The record of agricultural development during the same period may be appreciated from the undermentioned figures.

Harvests	1934-38 average tons	1943-44 tons	% increase
Wheat .. · ..	1,651,000	3,449,000	109
Barley	765,000	1,641,000	115
Oats	1,940,000	3,059,000	58
Potatoes	4,873,000	9,822,000	102
Sugar-beet ..	2,741,000	3,760,000	37
Vegetables ..	2,384,000	3,197,000	34
Fruits	455,000	705,000	55

The post-war world food shortage has made it necessary for U. K. to continue to maintain a high level of production of grains and other crops for home consumption.

Cattle-rearing. Cattle are reared in every part of the United Kingdom. They are mostly domesticated for their milk, meat and hides. The number of cattle in 1949 was about 10 million. Between 1939 and 1949 the number has increased by 2 millions. The dairy is important in the following regions :

(*i*) Cornwall, Devon and Somerset. Cheese and cream are made here.

(*ii*) Welsh lowlands. Milk and cheese are produced for the dense population of the South-Wales coal-field.

(*iii*) Cheshire. It is the most important dairying area in England. Cheese and milk are important products.

(*iv*) The vales of Oxford and Aylesbury. Milk is sent to London from here.

(*v*) Ireland is particularly noted for dairying which is carried on in the plains of the south-west and in the north.

Britain is noted for her export of pedigree livestock and since the end of World War II there has been a marked recovery of the export trade in livestock of high quality. In 1949, about 2,000 pedigree cattle valued at half million sterling were exported from the United Kingdom.

Beef cattle are mostly reared on the Midland plains. In England there are more than 1,200,000 cattle. The United Kingdom had 2·8 million pigs in 1949 against 4·4 in 1938.

Sheep-rearing. At one time England was a great sheep-rearing country and the prosperity of the country depended on the animal industry. But to-day this industry is neglected and is carried on in those parts where either agriculture is unsuitable or population is sparse. Even then, the U. K. contains more sheep than there are in New Zealand. In 1949 the United Kingdom had about 20 million sheep.* The principal sheep-rearing areas are the following:

(1) The Pennines. (2) The Welsh mountains. (3) Highlands of Scotland. (4) Ireland.

The Fishing Industry

The fishing industry of Great Britain supports nearly one-twentieth of the population. It is one of the greatest of the British industries. The shallow waters of the continental shelf are the feeding grounds of a great variety of fish ; so the fishing industry has prospered. Fishing is mostly confined to the eastern coast of the country which faces the North Sea. Haddock, herring, cod and mackerel are the principal catches of the North Sea, and the ports engaged in this industry are Wick, Aberdeen, Peterhead, Stonehaven, Hull, Grimsby and Yarmouth. In the English Channel, near Cornwall, pilchard is caught.

Grimsby, on the Humber, has a world-wide reputation for the extent and value of its fisheries in northern waters, Iceland,

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* In 1939, the United Kingdom had 27 million sheep.

Faroes and the North Sea. The neighbouring Humber port of Hull concentrates on the distant water fisheries. Hull normally produces the biggest aggregate catch of fish in Britain, mainly cod and haddock. Aberdeen is the third British port. Fleetwood in Lancashire owes its importance to its unique position in relation to the western fishing grounds, and it is also near big industrial and coal-producing areas. A major part of its catch is hake, but cod and haddock also form a large proportion now-a-days.

PRODUCTION AND VALUE OF BRITISH CAUGHT FISH

	Quantity (metric tons)	Value (£ 000)
1938	1,045,462	16,548
1949	1,112,580	41,058

Net imports of fish of all kinds—fresh, frozen, salted or canned—into U.K. in 1949 amounted to 239,253 tons. In the same year, consumption of fish on an edible weight basis in the U. K. was 27 lb. per head.

Great Britain leads all countries in the fishing industry in the North Sea. In spite of such enormous catches Great Britain imports fish from countries like the U. S. A., Canada and Norway. Grimsby and Billingsgate (in London) are the two great fish markets of Great Britain.

The rivers of Great Britain supply fish, mostly salmon and trout.

Manufacturing Industries

The United Kingdom is the most industrialised country in the world. Her industries are mainly concerned with production of iron and steel goods, textiles and chemicals.

Among the manufacturing industries of the United Kingdom, the textile trades are second only to the iron and steel industry in the volume of employment which they afford. Of 1·5 million workers engaged, nearly four-fifths are found in the cotton and woollen industries and all the remainder are in jute, hemp, silk and linen. The majority of the workers in the textiles are women.

The British manufacturing industries are mostly on or near the coal-fields. Of late, other areas have developed industries with the use of electric power.

— why ?

The Principal Manufacturing Industries of the United Kingdom in 1939

Industry	*No. of persons employed*
Iron and Steel	635,651
Engineering, ship-building and vehicles ...	1,061,671
Non-ferrous metals	119,257
Textiles	1,075,553
Leather	48,294
Clothing	515,700
Food, drink and tobacco	505,621
Chemicals, etc.	191,080
Paper, printing, etc.	400,736
Timber	167,350
Clay and Building Materials	245,792
Building and contracting	434,374
Mines and quarries	840,634

Cotton-mill industry. The leadership of the United Kingdom in the cotton textile industry towards the end of the eighteenth century was due to a variety of causes. (*i*) "Her mercantile marine and colonial developments placed her in a strong position both for obtaining supplies of raw cotton and for serving foreign customers." (*ii*) The countries producing raw cotton were not industrially advanced. (*iii*) Her natural advantages in humid climate, water-power and coal supplies favoured the establishment of cotton industries. (*iv*) Contemporary engineering and metallurgical developments helped to work out a new technique of production. (*v*) India and other older cotton manufacturing areas were handicapped by political conditions that existed there. (*vi*) Europe was involved in political troubles and war.

The cotton industry has been localised mainly in Lancashire and the adjoining areas. 85 per cent of the workers engaged in the cotton industry are to be found in Lancashire, Cheshire and Derbyshire. Most of the remainder are in the West Riding and Scotland.

The localisation of this industry in Lancashire is mainly due to geographical causes. The spinning of cotton demands a moist climate, otherwise the thread breaks.* The moist westerlies give Lancashire the necessary degree of humidity for spinning. Secondly, Lancashire faces American ports, thus facilitating the import of raw cotton. Thirdly, the presence of coal, limestone and water-power was important in the early 19th century, when the factory stage of industrial development was on its way. Fourthly, the existence of a first class port in Liverpool is another great advantage. The inherent skill of generations of 5 operatives, the number of 6. inventions of machinery for cotton manufactures in Lancashire, and the 7 foresight and initiative of those citizens who carried out the scheme of the Manchester ship canal are the other vital factors which contributed to the growth of the South Lancashire cotton industry.

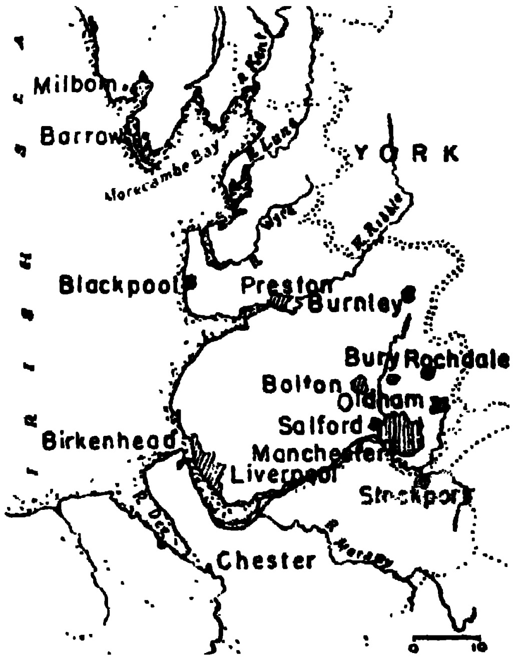

FIG. No. 60. The cotton-manufacturing towns of South Lancashire.

Great Britain does not produce raw cotton. She brings this raw material from (*i*) U.S.A., (*ii*) India, (*iii*) Egypt, (*iv*) Peru, (*v*) The Sudan and (*vi*) Brazil. As Lancashire is specialising more and more in the production of fine quality cotton goods, she takes most of her raw cotton from U.S.A., Egypt and the Sudan.

Lancashire towns may be divided into two classes according to their activities. Towns on the northern side (Preston, Blackburn and Burnley) are engaged in weaving. The southern towns specialise in spinning. Rochdale, Oldham, Bolton and Bury are the spinning towns around Manchester. The Lancashire industry depends mainly on export trade, 80 per cent. of the produce being exported.

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* To-day moist climate is no longer an important factor, for the air of factories can be moistened by artificial means.

There are also some noted centres in Scotland, among which Glasgow and Paisley are important. Paisley has specialised in the manufacture of thread. Glasgow had all the natural advantages of Lancashire, but the progress of iron and steel industries caused the industrial development to move along other lines.

The principal customers of British cotton goods are India, China, Egypt, Germany, Holland, Turkey, West Indies, South America, Central America, Central Africa, Japan, Australia, Canada, U. S. A., Spain, Italy, France, and Switzerland. Great Britain also imports considerable quantities of cotton goods from Japan, France, Germany and Switzerland.

Lancashire had virtual control over the world cotton market till 1913. Since then she has fallen down from that enviable position. Competition of Japan and the U. S. A. has taken much of her Eastern markets. Besides, many countries of Asia and Africa which previously used to import Lancashire cotton piece-goods now-a-days manufacture them. To add to these, protective tariffs and over-production have largely aggravated the depression. It is possible for Japan to manufacture cotton goods at a price far cheaper than what is required by Lancashire. Cheap labour, nearness to vast markets like China and India, and State support are the advantageous factors on the side of Japan.

PROGRESS OF EMPLOYMENT AND EXPORT OF COTTON TEXTILES FROM U. K.*

	Employment (in thousand)	Export Cotton yarn (in million lbs.)	Export Cotton piece goods (in million yds.)
1937 ..	.. 363	159	1,921
1947 ..	.. 228·1	26·7	533
1948 ..	.. 254·5	59·1	762
1949 ..	.. 267·5	82·0	904

A strong movement for the amalgamation of different concerns under a central organisation is afoot with a view to bringing about internal economies.

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* *Source* : Britain, 1950-51.

In the production of high-quality cloth, Lancashire holds her own in free competition ; but as regards coarse cloth she has lost much ground in competition with the East. It is doubtful if she will be able to regain much of the trade she has lost in the commonest qualities, and she may not be able to keep all the trade that she still holds. "The future of Lancashire will depend to a great extent on the ability to retain a large share of the trade in high-quality cottons and this will demand lower production costs. She must see that methods of organisation are capable of adjustment and, if required, of meeting changed and changing conditions and are kept at the highest pitch of efficiency."

Iron and Steel Industries

In the production of iron goods Great Britain occupies the fourth place in the world. The existence of local coal and iron in close proximity mostly accounts for the growth of iron and steel centres in the country. Production has been expanding rapidly. The steel production was 13 million tons in 1939 and it is now about 16 million tons. Until recently the steel industry has been operated under close Government supervision, and allocation of imported raw materials to the industry and distribution of steel to consumers were carried out under Government control. The Government control over distribution was terminated in May 1950 with the exception of sheet steel and tin plate. There are five important steel areas in the United Kingdom.

(*i*) *The Black Country*. This has become the chief iron and steel-producing area of Britain. Local supplies of iron, wood, charcoal and limestone gave birth to the industry in this area. The distance of the area from the sea makes cost of transport heavy, and, therefore, goods which are valuable in proportion to their bulk are manufactured here. The important centres are Birmingham, Coventry, Dudley and Redditch. *Birmingham* specialises generally in the production of motors, cycles, railway equipments, machine tools, electrical apparatus and brassware ; *Coventry* in cars and cycles ; *Redditch* in needles ; and *Dudley* in chains.

(*ii*) *Sheffield.* The manufacture of metal goods in the region owes its origin to the existence of local iron-ore, wood and water-power. The bulk of the iron-ore is now drawn from Lincolnshire and Sweden. Both heavy (*e.g.*, manganese steel,

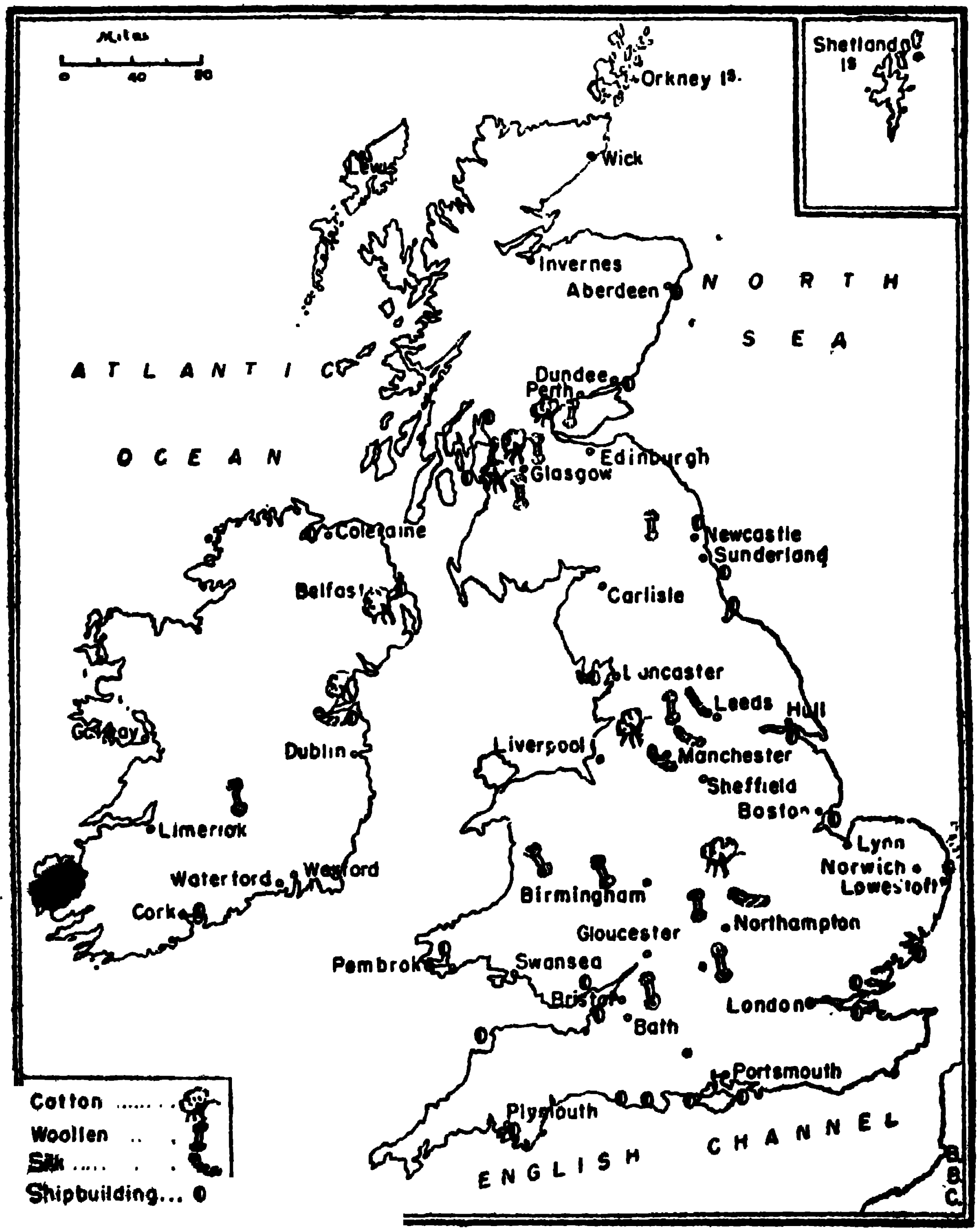

FIG. No. 61. The chief manufacturing regions of the British Isles.

chromium steel and tungsten steel) and light (*e.g.*, cutlery) metal goods are manufactured in Sheffield. Other centres are Rotherham and Chesterfield.

(*iii*) *The North-east Coast*: *The Tyne, Wear and Tees region*. Tee-side is the chief iron-smelting centre. Other towns in the locality are Hartlepool, Middlesborough and Darlington. The advantages of the region for steel industry are: (*a*) the nearness of the iron-ore, (*b*) the excellent coking coal of South Durham, (*c*) the supplies of limestone in the Pennines, and (*d*) the facilities for importing high-grade ore from Sweden and Spain. Hartlepool is noted for ship-building, Darlington is an important centre for railway engines and Middlesborough is an engineering centre. In Tyne-side the chief centre is New Castle where ships of modern design are built. Wear-side, with Sunderland as the chief centre, builds cargo-boats.

(*iv*) *The Furness District*. This North-Western coastal region produces steel and pig iron. Barrow is the ship-building centre.

(*v*) *South Wales* manufactures tin-plate and galvanised iron. Iron-ore is imported from Spain and Algeria, and tin is drawn from Malaya, Bolivia and Nigeria. Swansea and Llanelly are the two chief towns of the region.

The Central Valley of Scotland is becoming increasingly important for general engineering and ship-building (Glasgow, Greenock and Dumberton).

Ship-building is one of the principal industries of the United Kingdom.[*] The geographical position of the ship-building industry in any country is determined by two main requirements. These are: (*a*) a navigable river with easy access to the sea for launching purposes; (*b*) easily available supplies of the main building materials. If there is any change in the principle of building material, the geographical location of the industry may also change. This has, in fact, happened in Britain in the last century and a half. In the early days of ship-building, vessels were made of wood. The ship-building was carried on in those estuaries and harbours where local supplies of wood were available or where conditions were present for importing timber. One of the chief centres was the Thames. The change from wood to iron as the material for ship-building in the middle of the nineteenth century shifted the industry to centres close to iron and steel production. The reasons for the growth and success of the industry in Britain are the following :

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[*] Great Britain still holds an enviable position among the ship-building nations of the world. During 1946-49, nearly half the world's total of new tonnage was launched from British ship-yards. In the last 20 years, the percentage of tonnage launched in the United Kingdom to the world total reached the highest point at 57 in 1947 and the lowest level at 8 in 1943. Britain has been a leading ship-builder for foreign countries; in 1930 the tonnage of ships launched in U. K. for overseas countries was 650,000, and in 1949 it was 522,000 tons.

(a) Deep tidal estuaries.
(b) Coal-fields, with steel industries near the estuaries.
(c) The increasing demand for ships.

The ship-building industry of the United Kingdom is now concentrated in five principal regions :

(a) the North-east coast (rivers Tyne, Wear and Tees)
(b) The Clyde
(c) Belfast
(d) Birkenhead
(e) Barrow.

In the *North-East coast,* the chief centres are South Shields, New Castle and Wallsend, Sunderland, Hartlepool and Middlesborough. All types of vessels are built in the region. In the *Clyde* basin large passenger liners are built. Naval vessels are also constructed in this area. The Clyde yards are among the best equipped in the world. "In the ten years immediately preceding the present war, the North East coast region and the Clyde yards were responsible between them for some 75 per cent. of total British output." Although *Belfast* area has no large iron and steel producing region to back it, the necessary fuel and raw materials are easily imported from Scotland and Cumberland. Belfast specialises in the construction of motor ships.

Birkenhead undertakes naval ship-building, luxury liners and dredgers. *Barrow* has been an important centre for the construction of merchant vessels, submarine and naval vessels. The subsidiary centres for ship-building are Goole, Aberdeen, Dundee, Leith, Southampton and Cowes.

To-day there is no ship-building on the Thames. London was the chief centre in ship-building industry before the advent of iron. The building of ships on the Thames has become uneconomic because of the high cost in bringing fuel and steel from the distant centres of production. This industry on the Thames died out slowly and the last big vessel was built in 1911. But London has an extensive ship-repairing industry.

The woollen industry of Great Britain is older than the cotton industry, but it is now less important and not so highly organised. The industry is centralised in Yorkshire. The geographical causes underlying the localisation of this industry in Yorkshire are many:

(*a*) Necessary climatic conditions.
(*b*) Water-supply from the Pennines noted for washing and dyeing.
(*c*) Sheep-stock of the Pennines.
(*d*) Waterpower.
(*e*) Nearness to the sea-coast.

The West Riding of Yorkshire, where coal is found abundantly, is the principal seat of the woollen industry. The towns principally engaged in this industry are Leeds, Bradford, Halifax and Huddersfield. Bradford produces worsted goods, and Halifax manufactures enormous quantities of carpets. The supply of wool from the neighbouring pastures cannot meet the demand of the industry and much wool is imported from Australia, New Zealand, South Africa, British India, Argentine and Uruguay. England imports more than 60 per cent. of New Zealand wool, 25 p.c. of Argentine wool, 30 per cent. of South African wool and 35 per cent. of Australian wool. At present England is the largest importer of wool in Europe. The principal customers of British woollen products are Germany, Japan, Sweden, Norway, Denmark, Italy, Spain and U. S. A. The British wool industry has a high reputation for quality and it has never endangered its quality by indiscriminate mechanisation.

The Leather Industry of Great Britain is the third largest leather industry in the world. The industry is marked by a very high degree of specialisation. Its standards of quality are exact and are accepted throughout the world. About 8 to 10 million lambskins, a much smaller number of calf-skins, some two and a quarter million cattle hides and a few horse and bull hides are normally available each year from domestic stock. About one-third of the total raw material needed is thus obtained. The rest is imported. India is the largest single supplier of goat-skins. The leather centres are London, Bristol, Liverpool and Glasgow. In 1946 the British Leather industry engaged 30,000 workers. The chief centre for heavy leather in England is in the South Lancashire district which extends from Liverpool to beyond Manchester. There are also heavy leather centres in Yorkshire, Essex, Kent and Surrey. Light leather centres are widely distributed.

Other industries include chemicals, glasswares, silk, jute and artificial silk. Great Britain is an important manufacturer of heavy chemicals as she has an abundant supply of chemical salt. Chemicals and glasswares are manufactured in South Lancashire and Cheshire where salt deposits are available. Midland towns are important for leather industries. Jute is manufactured at Dundee.

Transport

Great Britain has one of the most intensive *railway systems* in the world. The main line system has been geographically divided into six main regions: (*i*) London Midland Region, (*ii*) Western Region, (*iii*) Southern Region, (*iv*) Eastern Region, (*v*) North Eastern Region and (*vi*) Scottish Region. In 1949, the British Railways carried 993 million passengers and 280 million tons of freight. The route mileage was 52,000.

No country has a greater mileage of *roads* than U. K. in proportion to size. There are over two miles of public highway for every square mile of territory, making a total of 184,000 miles of road. "If there are more roads in Britain than in any other area of comparable size, there is also a greater density of motors per mile than in any other." In 1949, there were 4 million motor vehicles on the roads.

The main *inland waterway* routes in England and Wales stretch from the major estuaries of the Humber, Mersey, Thames and Severn and converge on the Midlands, which are served by a network of canals. There are also important routes between the Humber, the Trent and the Mersey. The chief canals are Lancaster Canal, Leeds and Liverpool Canal, Manchester Ship Canal, Lee Navigation, Trent Navigation and Sheffield and South Yorkshire Canal. In Scotland, the most notable canal is the Caledonian, joining Inverness in the north-east with Fort William in the west.

The navigable mileage of all British Canals is 2,400.

British air services are operated by nationalised Air Corporations. In 1950 there were 97 aerodromes in U. K. under civil control. The main air-ports are London, Prestwick, Belfast, Birmingham, Liverpool, Manchester, and Northold. London air-port about 14 miles west of London has been developed as an international civil air-port. In 1949 this airport was used by 394,796 passengers. More than 8,015 tons of freight and 3,261 tons of mail were handled.

The air services are operated by two Corporations—British Overseas Airways Corporation and the British European Airways Corporation. • The *B.O.A.C.* (with British South American Airways—now merged into BOAC) operates the (*i*) North and South Atlantic, (*ii*) West, East and South Africa, (*iii*) Middle East, Pakistan, India, Ceylon and Burma, (*v*) the Far East and Australia.

B.E.C.A. covers the Continent of Europe and the Mediterranean. It also operates internal Services within the U. K.

The Commerce of Great Britain

At present the United Kingdom ranks second to the U.S.A. in total value of world trade. Her trade is all sea-borne. The predominance of imports over exports is the most peculiar feature of British Commerce. At first sight it might seem that she has an unfavourable balance of trade. But it is not so. Great Britain is a great lending country. She gives services in banking, insurance, shipping, and investments. These are generally known as "invisible exports". When we take into account the figure of earnings from these invisible exports, we find that Great Britain has undoubtedly a favourable balance of trade. The two aspects of her export trade are—(1) the exportation of the products of British industries and (2) the re-exportation of imported goods in substantially unchanged forms. The first includes the products of British soil, mines, forests, fisheries and factories ; the second includes such commodities as rubber, tea, wool and vegetable oil.

The pattern of foreign trade changed considerably since 1938.

THE PATTERN OF FOREIGN TRADE OF THE UNITED KINGDOM*

(In percentage of total value)

	1938	1946	1947
IMPORT			
Food, Drink and Tobacco ..	46·8	49·0	45·1
Raw materials	27·0	30·0	31·3
Manufactures	25·4	18·9	22·3
EXPORT			
Machinery	12·3	12·5	15·9
Vehicles	9·5	12·6	14·8
Iron and Steel	8·9	8·7	7·4
Chemicals	4·7	7·2	5·9
Textiles	21	19·2	19·0
Electrical goods	2·9	4·1	4·3

Great Britain is still the world's best customer. She absorbs about 21 p.c. of the total exports of the world. Her share in the total exports of the different countries is shown below.

Regions	P.C. of total exports absorbed by Great Britain.	Regions	P.C. of total exports absorbed by Great Britain.
Canada	40	Africa	24
U. S. A.	17	Asia	14·7
Latin America ..	15	Australia	61
Europe	12	U. S. S. R. ..	29

* VALUE OF IMPORTS FROM U. K., 1951.

(£ million)

I	Food, Drink and Tobacco	1,299
II.	Raw materials	1,715
III.	Articles wholly or mainly manufactured ...	885
IV.	Other imports	15
	Total imports	3,914

EXPORTS OF U. K. PRODUCE, 1951.

(£ million)

Vehicles	447
Machinery	365
Iron and Steel	160
Chemicals	143
Textiles	537
Pottery, glass	67
Food, Drink and Tobacco	161
Coal	29
Total exports ...	2,580

In 1938, she was the ***best customer*** of the U.S.A., Canada, India, Holland, Australia, Sweden, Argentina, South Africa, Denmark, U. S. S. R. and New Zealand ; the *second best* of Germany, Poland, Switzerland and British Malaya, and the *third best* of France, Czechoslovakia and Brazil. Thus the prosperity of many countries whose economies are dependent upon a flourishing export trade is bound up with the prosperity of Great Britain as the world's best customer.

Great Britain is also a great seller. Indeed, till 1914 she was the greatest exporter in the world. After the first World War, however, the U. S. A. took the first place as an exporting nation ; but in 1938 Britain was a good second.

In the total export trade of U. K. the manufactured goods alone account for 80 per cent. or more. The only important export outside manufactured goods is coal. The chief articles of export are cotton goods, iron and steel, woollen goods, chemicals, paper, machinery, leather goods, tobacco, jute, arms and ammunitions.

The principal imports may be divided into three groups:

(*a*) Food, drink and tobacco.

(*b*) Raw materials.

(*c*) Manufactured articles.

Food, drink and tobacco: wheat, flour, maize, oats, pulses, rice, barley, rye, dairy produce, fish, meat, tropical and subtropical fruits, sugar, spices, tea, coffee, cocoa, wine, tobacco, vegetables, etc. The foodstuffs constitute the most important item in the import trade because the United Kingdom is self-sufficient to the extent of 45 per cent. only of her needs.

Raw materials: cotton, wool, flax, jute, silk, hemp, rubber, furs, timber, oil-seeds, petroleum, hides and skins, sponges, ivory, tanning materials, iron ore, copper, lead, manganese, zinc, tin, gold, silver, etc.

Manufactured articles: cotton yarn and cotton manufactures, leather goods, iron goods, glass, electrical goods, silk goods, porcelain, etc.

The principal import markets of the United Kingdom in 1949 were the following, placed in order of importance:

	£ (million)		£ (million)
Canada	225·4	New Zealand	117·0
U.S.A.	221·9	South Africa	33·2
Australia	212·4		
India and Pakistan ..	141·0	Irish Republic ..	55·4

Total value of imports in 1949 was £2272 million against £920 million in 1938. In 1950, total imports increased to £2603 millions. This increase was caused mainly by higher prices and only to a very small extent by an increased volume of imports.

SOURCES OF BRITISH IMPORTS

Food

Wheat: Canada, Argentina, Australia.
Rice: Burma, Siam, Spain.
Sugar: Cuba, Australia, Mauritius.
Tea: India, Ceylon, Java.
Coffee: British East Africa, Costa Rica, Brazil.
Cocoa: Gold Coast.
Beef: Argentina, Uruguay, Brazil, Ireland.
Mutton: New Zealand, Australia, Argentina.
Butter: New Zealand, Denmark and Australia.
Cheese: Holland, Canada, New Zealand.

Non-Food

Cotton: U. S. A., Sudan, Egypt, India.
Jute: Bengal.
Flax: Russia, Belgium, Baltic States.
Wool: Australia, New Zealand, South Africa, Argentina.
Wood: Sweden, Finland, Canada, Russia.
Rubber: Malaya States, Ceylon, Straits Settlements.
Iron ore: Spain, Algeria, Sweden.
Tin: Malaya States, Bolivia, Chile, Nigeria.

The principal export markets of the United Kingdom in order of importance are the following:

1949	£ (million)	1949	£ (million)
Union of South Africa	124	U.S.A. ..	57·3
India, Pakistan ..	164·9	Canada ..	79·8
Australia	188·6		
Eire	76·7	New Zealand ..	64·5

The total value of exports in 1949 was £1784 millions against £471 millions in 1938. In 1950 there was a substantial expansion of total U. K. exports which were valued at £2,255 millions. This expansion was due mainly to an increased volume of exports rather than to increased export prices. Metals and engineering products account for 50 p.c. of the total exports.

Great Britain has trade relations throughout the world. A brief account is given below :—

(*i*) North America :—The chief British ports trading with North America are Liverpool, Glasgow, Southampton and London. The products which come from North America to British Isles are timber, meat, dairy produce, leather and hides, furs, fish, wheat, raw cotton, maize, oats, tobacco, machinery, textile, petroleum, copper, zinc, silver, glass, graphite, rubber goods, etc. The exports to North America are machinery, chemicals, luxuries, wines, textiles, iron goods, non-ferrous metals, etc.

(*ii*) Central and South America and West Indies :—The chief articles which come from these countries to Great Britain are rubber, cocoa, coffee, raw cotton, tobacco, sponges, copra, silver, petroleum, oil-seeds and spices ; and the important items of export to these countries are cotton, machinery, wine and spirit.

(*iii*) South America :—The chief imports from South America are meat, wheat, maize, hides and skin, timber, copper, wool, coffee, sugar, cocoa, nitrates, rubber, petroleum, etc. ; and the exports to that continent are machinery, implements, glass, ships, locomotives, non-ferrous metals, motor cars, chemicals, iron-goods, leather goods and coal.

(*iv*) Tropical East and West Africa :—Cotton goods, tin goods, knives, guns and implements are the main articles of exports from British Isles to these countries ; and the chief articles of import from these are palm oil, ivory, rubber, gum, spices, cocoa, coffee, raw cotton, timber, oil-seeds, cane sugar, etc.

(*v*) South Africa :—Imports to the British Isles from South Africa consist of ostrich feathers, wool, hides, diamonds, gold, copper, tea, wine and fruits. Exports from the British Isles to these places are textiles, chemicals, iron goods, clothing, leather goods, locomotives, motor cars, machinery, implements, arms and ammunition, etc.

(*vi*) China and Japan :—Great Britain exports textile goods, iron goods, machinery, tobacco, arms and ammunition. She imports tea, raw silk and silk goods, rice, sugar, toys and matches from China and Japan.

(*vii*) South-East and South-West Asia :—The imports are petroleum, tanning materials, wheat, rice, maize, jute, cotton, spices, oil-seeds, coffee, tea, indigo, timber, ivory, wool, gold, tobacco, hides and skins, gutta percha, rubber and pulses. The principal exports of Great Britain are textiles, machinery, leather goods, tobacco, coal, paper, locomotives, cotton goods and iron goods.

(*viii*) Australasia :—Exports to Australasia consist of locomotives, motor cars, machinery, luxuries, chemicals, non-ferrous metals, ships, etc., and the imports from Australasia are mutton, butter, wheat, flour, wool, silver, gold, copra, wine, skin, etc.

(*ix*) West and Central Europe and Russia :--Imports of the British Isles are dairy produce, eggs, beet sugar, timber, wheat, forest products, fur, flour, wine, iron goods, hides, chemicals, platinum, etc. Exports of the British Isles are coal, textiles, iron goods, machinery, paper, leather goods, fish, etc.

(*x*) Baltic Countries :—The imports from Baltic countries are dairy products, bacon, fish, eggs, skin, matches, etc. ; and the exports consist of coal, iron goods, machinery, textile goods, ships, non-ferrous metals, etc.

The United Kingdom depends on the Commonwealth countries for a large percentage of her imports and exports.

Exports		Imports	
P.C. of the total		P.C. of the total	
India	8·5	India	7·3
S. Africa	8·5	Canada	8·3
Australia	7·3	Australia	7·3
Total Commonwealth ..	49·2	Total Commonwealth ..	39·2
Europe	26·7	Europe	29·0

The balance of trade with the Commonwealth countries is always favourable to the United Kingdom.

The *effects of the World War II on the trade of Britain* are as follows: (*a*) she has become very much dependent on American supplies ; (*b*) as the cost of primary products imported by her has risen, the cost of her manufactured goods has therefore gone up. This in turn has affected her export trade ; (*c*) Britain's reserves of gold, dollars and dollar equivalents have been depleted.

Britain now aims at reducing the excessive dependence on America as a source of supply so that there may be less drain on dollars. Her plan is also to reduce imports by encouraging greater production and the development of substitutes at home and to increase exports by greater production and productivity.

THE IMPORTANT COMMERCIAL AND INDUSTRIAL CENTRES AND SEA PORTS OF GREAT BRITAIN

London is situated on both banks of the river Thames, at the head of its ocean navigation. London is the capital of the United Kingdom and the largest city in the world ; it is also the world's greatest sea-port and financial centre. The imports of London are much greater than the exports, because it is the distributing centre for the whole Kingdom. London controls most of the British foreign and colonial trade with the Baltic and the Mediterranean ports. Tea and other products from the East and wool from Australasian colonies find their chief European market in London. *Birmingham* is the commercial and industrial centre of the Midland. It specialises more particularly in small metal goods of all kinds—steel pens, swords, guns, brass-work, and the standardised parts of bicycles and motor cars. *Liverpool* is the most important port on the west coast of Great Britain. The imports are chiefly raw materials and food-stuffs from the U. S. A., Canada, South America, West Africa and West Indies (especially cotton, grain, oils, paint, animals products, tobacco, etc.). The principal exports are manufactured goods of cotton, wool, iron and chemicals. Liverpool itself is not a noted manufacturing city ; exports and imports are for the neighbouring towns. *Manchester* is the chief centre of the cotton textile industry of Lancashire and is known throughout the world as the cotton metropolis. *Sheffield* is the chief centre of the heavy steel and cutlery trade. *Leeds* is the centre of a great trade in ready-made clothing, leather and machinery. It commands the largest share of the leather trade of the United Kingdom and has important soap works and oil refineries. *Bristol,* near the estuary of the Savern, is a very old port. It carries on a considerable trade with America, particularly in the import of tobacco. *Hull,* situated on the Humber estuary, has a busy continental trade especially with Hamburg and Bremen. *Bradford,* in the West Riding of Yorks, is the chief seat of the worsted manufactures. Silk, velvet and dye are other products of this place. *Southampton,* on the south coast of England, at the head of a deep land-locked inlet, is noted as a terminus for American steamship lines. *Sunderland,* at the mouth of the Wear, is the most important ship-building centre in England. It has glass-works, chemical factories and rope-works. *Oldham,* a smoky town of South Lancashire, is noted for its cotton yarn and textile machinery. *Cardiff,* the largest town in Wales, carries on an immense coal-trade, sending more coal to foreign countries than any other town. It has chemical industries, ship-building yards, iron foundries, etc.

Swansea, the second town of Wales, does a vast trade in the smelting of iron, copper, silver, zinc, tin and lead. The iron-ores of northern Spain are received here ; the copper-ores come from the Str. Settlements and the East Indies. *Glasgow,* on the river Clyde, is the largest city of Scotland. As a port on the western coast of Great Britain, it is favourably situated to receive raw materials from America. Glasgow is the centre of one of the busiest industrial areas of the world. Its industries are based on ship-building and its dependent activities. It also supplies many important markets of the world with steel goods. *Edinburgh* is situated on the southern shore of the Firth of Forth. It is an educational and distributing city. *Dundee,* the third city of Scotland, is the chief centre of the jute industry. It is also an important fish market. *Aberdeen* is the fourth city of Scotland. The industries and commerce of this port are in a flourishing condition. Woollen clothes and carpets, linen sheets, chemicals, machinery and canvas are the leading products. The largest comb factory in the world is established here. *Belfast* is the busiest city of Ireland. It produces linen goods and is a ship-building centre. *Dublin* is the capital of the Irish Free State. The making of poplin, the manufacture of biscuits, dyeing, the brewing of beer and the distilling of whisky are the principal industries. *Limerick* has important manufactures of linen, spirits and liquors.

Germany

Germany proper has an area of 181,630 square miles with 70 million population. The population density per square mile is 441. The Greater Germany of 1939 consisting of Germany proper, Austria and Sudetanland covered an area of 225,199 square miles with 80 million people.

Germany is a great industrial and commercial country. Many factors—physical and human—have contributed towards her progress. The physical factors are: (*i*) situation of the country in the heart of the leading industrial continent, (*ii*) mineral wealth like coal, iron, potash, zinc, (*iii*) fertility of land, (*iv*) perfect waterways, (*v*) invigorating climate, and (*vi*) forest resources. Among other factors Government and race are the most important. The growth of German foreign trade is the outcome of largely Governmental efforts. The industrial expansion in Germany really began after 1871, when the German people attained unification in the Empire and inaugurated a comprehensive, co-ordinated, national industrial policy. As a result of her victory in the Franco-German War, Germany got 5 billion francs from France as indemnity and acquired the provinces of Alsace and Lorraine. Further impetus to industrial growth was given when Germany in 1888-89 entered upon the role of a coloniser and world power and developed foreign markets successfully. In 1914 Germany stood next to Britain in industry and commerce.

The climate of Germany is more or less continental everywhere. The southern side of the country is mountainous and full of forests while the north is plain. From the agricultural point of view, Germany is a land of small estates and peasant proprietors in the west and south, and of large estates in the north. Intensive cultivation is practised efficiently and the products are wheat, rye, oats, beet and potatoes.

Transport. The great industrial development of Germany was made possible because of the excellent transportation system. Communication by land, water and air is well organised by careful co-ordination. The railway system of Germany is one of the best in the world. In 1940, Germany had 43,000 miles of railway lines. The topographical features and average altitude are such that it has been possible to extend the railways throughout the country.* In air-transport she was equal to any other country of the world till 1939.

The plain of Germany has an efficient system of waterways. In no other country has the advance of trade and industry been affected more profoundly by the development of water transport than in Germany. The river system is magnificently extensive. The important rivers are Rhine, Elbe, Oder and Vistula. The rivers have been deepened and connected with one another by canals so that there is now a complete system of water communication over a large part of the country. The Rhine is connected with the Weser to the east, with the Danube to the south and with the Meuse to the west. The Rhine is also connected with the French Waterways through the Rhine-Rhone and the Rhine-Marne canals. There is no other river in the world which is more important than the Rhine as a waterway. The traffic on the Rhine is comparable to that on the Great lakes of North America. The Elbe, the Oder and the Vistula are joined by canals. The Elbe flows through the most densely populated part of the country and is connected with the Baltic through the Kiel canal. The Oder flows through the agricultural districts and canals have been constructed to join the river with the Elbe. As an artery of trade the Danube is of minor importance to Germany. The volume of traffic passing through this river is very small. The other minor rivers are the Ems, Inn, Spree, Main and Aller. The total length of navigable rivers and canals is approximately 7,000 miles. Normally one-fifth of Germany's goods traffic moves along waterways.

In 1938 the *Midland Canal* was opened, which has now made it possible to connect the waterways from east to west. The Danube will soon be connected with the German canal system by the *Oder-Danube Canal.* The construction of this canal would have been completed by now but for the war. The Oder-Vistula canal is being extended towards the east to connect

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* Much of Germany's railroads had been destroyed during the World War II. It is doubtful if all the lines will be restored in the near future.

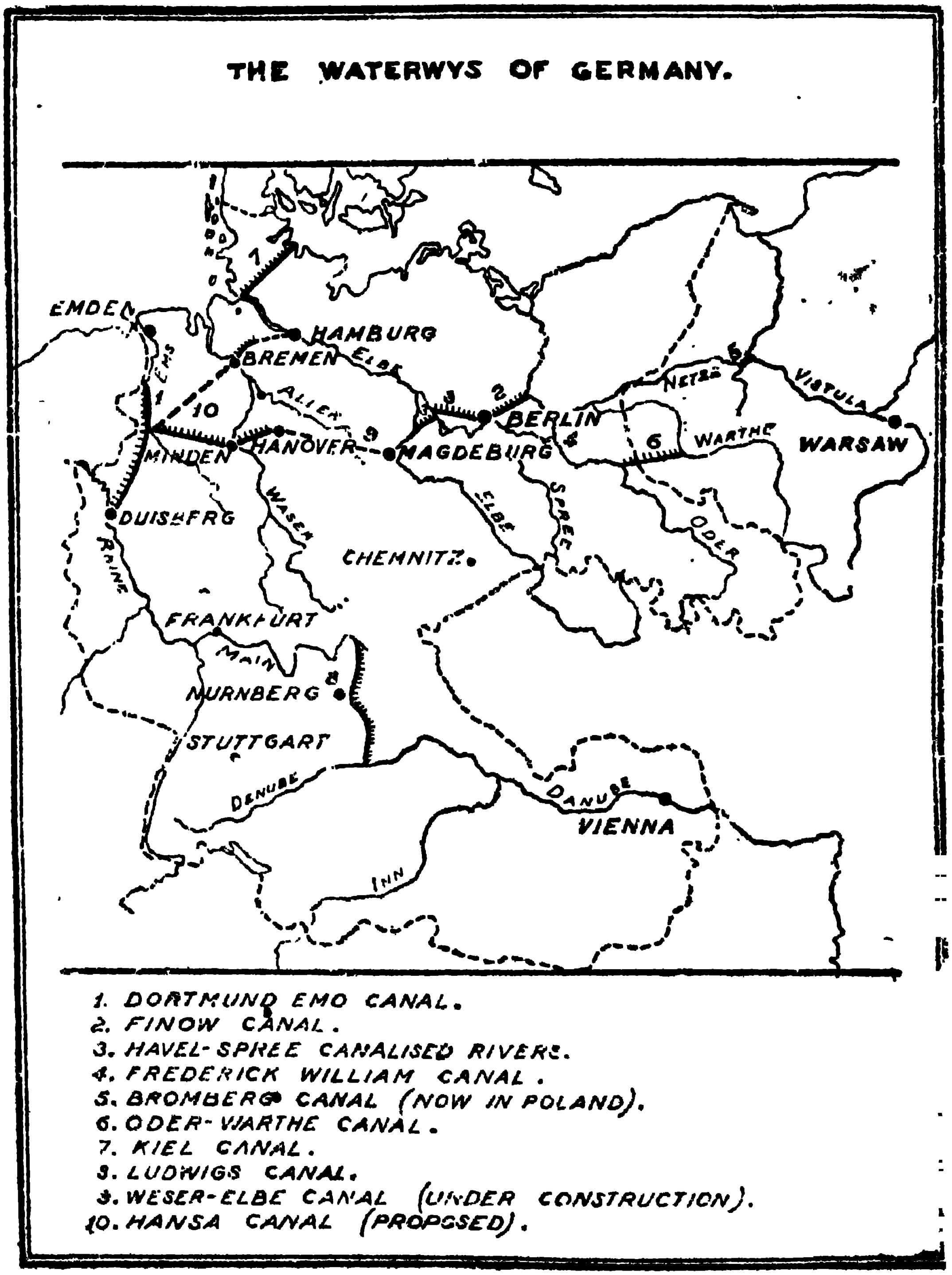

FIG. No. 62. The Waterways of Germany.

it with the Dneister river so that ultimately there can be through inland water communication between Germany and Russia.

Central and Northern Germany will also be soon connected with the Danube by the *Elbe-Oder Canal* and the *Rhine-Maine-Danube Canal* respectively.

Mining. Germany takes a very high place in mineral products, among which coal and iron are the most important. Coal and iron-ore, while not located in quite such proximity as in England, are abundant, and, on the whole, are easily brought together. The chief coal-fields are those of the Ruhr, Westphalia, Saar, Upper Silesia, Lower Silesia, Zwickaw and Lugau (in Saxony). Iron deposits are found in the field of Westerwald (Prussia), the Lahn-Dill region, Upper Hesse district and the Peine-Salzgites district. Before 1918 Germany was the largest producer of iron ores in Europe. Lorraine and Luxembourg supplied 75 per cent. of the country's production. Between 1871 and 1914 Germany built up her strength on the possession of iron of Lorraine and the coal of the Ruhr and the Saar. In 1918 Lorraine was ceded to France and Luxembourg to Belgium. Zinc and lead are obtained from Silesia and the Rhine coal-fields at Rachen. Salt is found abundantly in Saxony and has enabled Germany to improve her agricultural and chemical industry. Germany raises nearly half a million tons of petroleum every year.

PRODUCTION OF PRINCIPAL MINERALS[*]

Year	1937	1949	Year	1937	1949
Coal ..	184,512	103,238	Iron ore ..	9,791	8,032
Lignite ..	184,708	72,268	Potash ..	1,673	7,033
Rock Salt	2,757	—	Petroleum ..	451	—
Copper ore	1,263	—	Zinc ..	165	—

In 1940 coal output was 186 million metric tons bituminous and 195 million metric tons lignite.

Manufactures. Germany is one of the leading manufacturing countries of the world. *In the application of science to industry, she is still the leader.* Nowhere else in the world scientific and technical education has received greater attention. Another special feature in modern German manufactures is the adoption of rationalisation. *Rationalisation* denotes those methods by which the cost of production may be reduced. "It includes standardisation, simplification of varieties, waste reduction, scientific management, the replacement of hand labour by machinery and economy in selling."

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[*] 1949 figures refer to Western Germany.

The great drawback of the German industrial system is the location of the principal industrial regions, especially the Ruhr, very close to the frontiers. Her industrial centres are, therefore, liable to aerial attacks during war.

The Chief Manufacturing Industries

1. Iron and steel production..
2. Chemical industries.
3. Electrical goods.
4. Textiles—Cotton, Woollen and Silk.

The basis of the industrial strength of modern Germany is the manufacture of iron and steel. The iron and steel production of Germany is controlled by Cartels. Till 1918 Germany was easily the leading producer of iron and steel. Much of the iron-ore is imported from France, Sweden and Spain. One great advantage of Germany in the matter of iron and steel production is the abundance of coal near iron-deposits. Moreover, the perfect waterways of the country permit easy transport of goods. The basin of the Ruhr river is the principal iron and steel-producing region of Germany. This area supplies near about 80 per cent of the total German coal output. Local iron-ore is not enough to support the industry, and, therefore, large supplies are brought from Spain and Sweden. Till 1919 the Ruhr industrial area used the ores of Lorraine and Luxembourg. The great advantage of the Ruhr area is the presence of the Rhine which facilitates the import of raw materials and export of finished products. This part of the region is level and has facilitated an elaborate construction of roads, railways and canals to connect the areas with ports. Today, the *Ruhr area is the greatest manufacturing region of Germany.* Essen, Bochum, Dortmund and Dusseldorf specialise in heavy engineering and machinery works.

Other iron and steel-producing areas include the Hartz mountains, Saxony and Upper Silesia. *Stassfurl,* in the Hartz mountains, has metal manufactures, largely based on imported ore. Saxony, with *Chemnitz* and *Zwickaw* as chief centres, makes machinery.

Of late, Germany has made tremendous progress in *ship-building industry*. In respect of tonnage, she occupies the fifth place in the list of countries having mercantile marine. The possession of tidal estuaries and coal-fields near them have helped the ship-building industry greatly. The ship-building areas are: (*a*) the Elbe estuary with Hamburg as the centre, (*b*) Lubeck Bay with Lubeck, (*c*) the Weser estuary with Bremer-Haven and Bremen, and (*d*) the mouth of the Oder with Stettin.

Electrical machinery is manufactured in Berlin and Magdeburg.

In *chemical industry* the supremacy of Germany is indisputable. The *spread of scientific and technical education in Germany is a contributing factor in developing chemical industry.* The results of the researches in the laboratories of the universities are turned to practical use as nowhere else in the world. The possession of potash salt gave additional impetus to this industry. The industry has developed in the Elbe and Ruhr basins because of the supplies of coal. Elsewhere the industry receives cheap hydro-electric power. In the Elbe basin, heavy chemicals are made in Stassfurt and Schonebeck. The coal-tar chemicals are made in the Rhine basin with Essen, Frankfort, Elberfeld and Lidwigsaften. Munich and Burghausen are noted for electro-chemical industry.

The German *textile industries* are concerned with the production of cotton, wollen and silk goods. Although cotton mills are scattered throughout the country, two areas are particularly important—the Ruhr coal-field and Saxony. Raw cotton is imported from the U.S.A., Brazil and Egypt. The chief cotton-manufacturing centres are Munchen-Gladbach, Chemnitz and Zwickaw.

The *woollen* industry is very widely distributed in Germany and the chief centres are on the coal-fields. Aachen, Chemnitz and Bremen are the woollen centres. The German silk industry is confined to the Ruhr coal-field.

Beet sugar is manufactured in the provinces of Saxony, Silesia, Hanover and Pomerania. Till 1914, the German sugar industry rose to international significance. The World War I, however, was responsible for the destruction of the German sugar industry. Even after 1919, this industry never again regained its previous position. Brewing is also an important industry, and German beer has demand both in the country and outside. Glass, porcelain and earthen-ware are important in Bavaria, Silesia, Thuringia, Bradenburg and Saxony. Other manufactures are clocks and wooden wares in Baden, Bavaria and Wurtemburg and alcohol in Bavaria.

Foreign trade. Germany has extensive trade relations with foreign countries and most of the oversea trade of the country passes through Hamburg, Bremen, Rotterdam and Antwerp. The imports consist of food-stuff and raw materials such as coal, coffee, raw cotton, cereal, dairy produce, oil seeds, wood and wool. Germany in 1938 was the second best customer in the world and absorbed 10·9 per cent of the world's total exports. The electro-technical products, iron and steel goods, machinery, chemicals, sugar and woollen goods are her chief exports.

At present the level of industrial output in Germany has declined considerably due to the destruction of factories and industrial areas during the World War II. It has been estimated that the present level of industrial output is only 30 per cent. of the pre-war level. The prospects of the German trade will depend on the speed with which Germany can improve her position.

Trade centres. Berlin, the capital of the Republic, is situated in the centre of the northern plain and is provided with facilities for communication in every direction. It is an important industrial and commercial town and it is also the centre of the railway system of the country. It has the largest population in Europe with the exception of London. *Hamburg* is an important river port situated on the Elbe, sixty miles from the sea and has large foreign commerce. *Leipzig* has a large book and printing trade. It is also one of the greatest fur markets in the world. *Dresden* is a great commercial and industrial town, situated on the Elbe. It is specially known for machinery and brewery. *Cologne* is a river port situated on the Rhine. Apart from its importance as railway centre, the town is noted for wine-making and steel-production. It is also a railway centre. *Nuremburg* is famous for toy and pencil factories. *Bremen* is situated on the Weser and is important for ship-building. *Magdeburg* is a great sugar centre.

Germany's industrial weakness: (*i*) Alhough Germany is a great iron and steel-producing country, her supplies of iron-ore are very limited. More than two-thirds of Germany's requirements have to be imported from Sweden, Spain, Luxembourg, Algeria, France and the U.S.A. Germany's iron-ore is of low grade. (*ii*) She is very deficient in copper, tin and bauxite. (*iii*) Toughening minerals such as manganese, chromium, tungsten, nickel, molybdenum, cobalt and vanadium are practically absent. All these minerals come from Africa, America and China. (*iv*) Her output of natural oil is negligible. Synthetic oils have been discovered, but their usefulness has not yet been satisfactorily demonstrated. (*v*) Cotton is entirely lacking, and, even with home-produced wool, flax and synthetic products the textile industry is only 25 per cent. self-sufficient. (*vi*) Germany is very short of vegetable oils and all tropical products.

Her deficiencies in rubber and textile fabrics are partly overcome by the use of buna (Synthetic rubber) and "er satz" (substitute) clothing.

Political and Economic Changes in Germany

Her colonies before 1918 consisted of German South West Africa, German East Africa, the Cameroons and Togo in Africa ; Kaiser Wilhelm's Land, Papua, North New Guinea, New Britain Archipelago (Bismarck), Solomon Islands, Tonga, Upolu, Carolines, the Mariannes and the Pelew Islands in the Pacific. The Pacific colonies were considered important commercially and as naval bases from which the power of the German Government could be extended to rich and populous countries.

As a result of her defeat in the First World War in 1918, her colonies were taken away from her and distributed as follows:—

German East Africa to Union of South Africa.
German South West Africa to Belgium.
Togoland to France.
The Cameroons to British Isles.
Pacific Colonies: North of Equator to Japan.
Pacific Colonies: South of Equator to Australia.

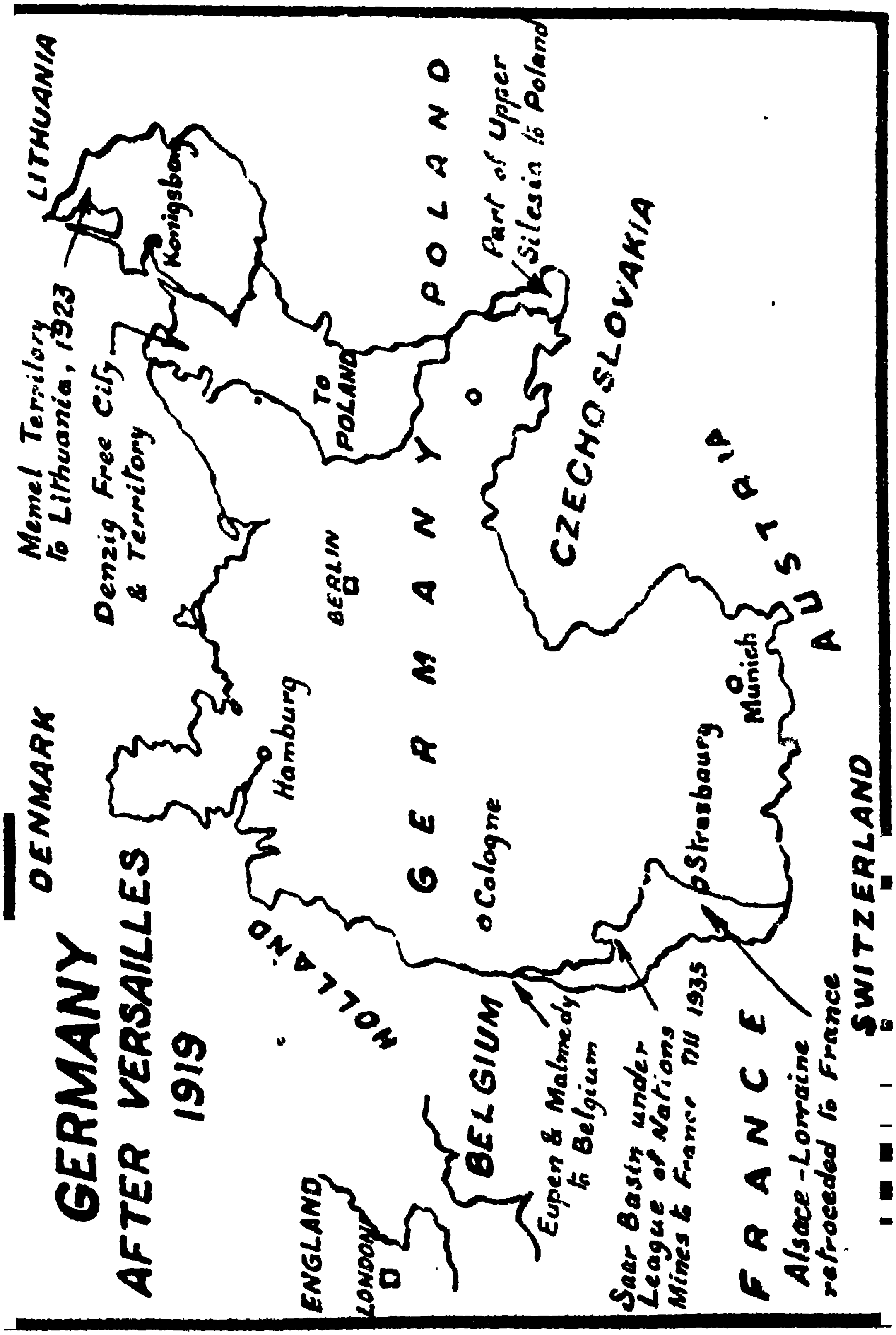
GERMANY AFTER VERSAILLES 1919
DENMARK
LITHUANIA
Memel Territory to Lithuania, 1923
Denzig Free City & Territory
Konigsberg
POLAND
Part of Upper Silesia to Poland
CZECHOSLOVAKIA
AUSTRIA
SWITZERLAND
FRANCE
Alsace-Lorraine retroceded to France
Saar Basin under League of Nations Mines to France Till 1935
Eupen & Malmedy to Belgium
BELGIUM
HOLLAND
ENGLAND
LONDON
GERMANY
Hamburg
BERLIN
TO POLAND
Cologne
Strasbourg
Munich

FIG. No. 63.

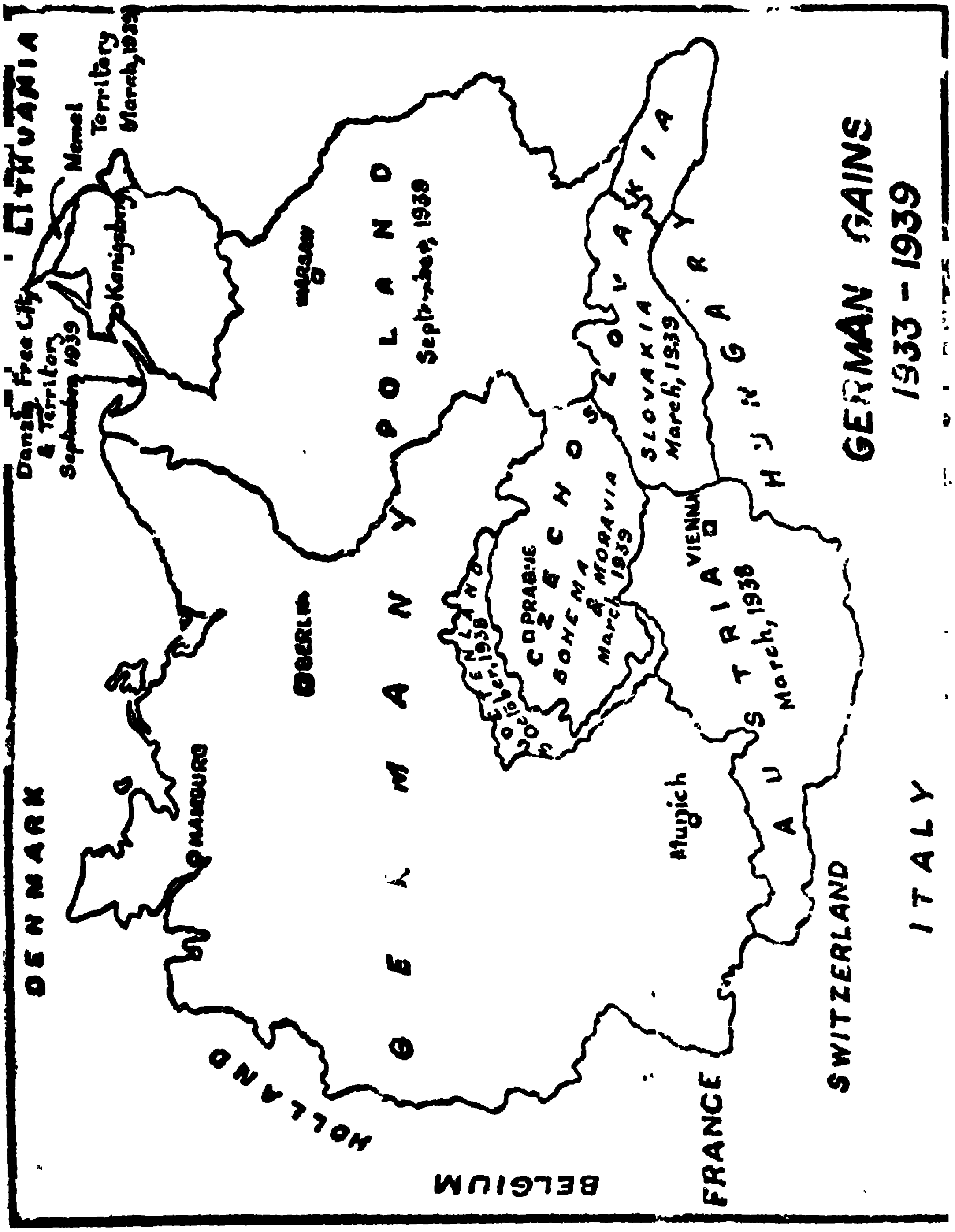
GERMAN GAINS
1933 - 1939
LITHUANIA
Memel Territory March, 1939
Danzig Free City & Territory September, 1939
Konigsberg
DENMARK
HAMBURG
BERLIN
GERMANY
WARSAW
POLAND
September, 1939
SUDETENLAND
October, 1938
PRAGUE
CZECHOSLOVAKIA
BOHEMIA & MORAVIA
March, 1939
SLOVAKIA
March, 1939
VIENNA
AUSTRIA
March, 1938
HUNGARY
Munich
HOLLAND
BELGIUM
FRANCE
SWITZERLAND
ITALY

FIG. No. 64.

EUROPEAN TERRITORY LOST TO GERMANY IN WORLD WAR I

	Population	Area (sq. miles)
Alsace-Lorraine	1,874,014	5,607
Saar Basin (under League of Nations for 15 years) ..	713,105	744
To Belgium (Eupen and Malmandy)	60,003	400
To Poland	3,854,971	17,816
Memel	141,238	1,026
Danzig	330,630	739
To Denmark (Sleswig) ..	166,348	1,542
To Czechoslovakia	48,446	122
TOTAL ..	7,188,755	27,996

The loss of Alsace-Lorraine meant loss of territory, population, iron-ore and Potash. In Sleswig, Eupen and Malmandy, Germany lost strategic barriers. Danzig was a leading Baltic port. The areas ceded to Poland contained minerals, forest and agricultural lands. The Rhine traffic came under the control of the League of Nations.

All these losses in territories and colonies as well as the reparation payment could not keep Germany weak for long. By 1938 she emerged economically strong and resourceful. She got back Saar basin by plebiscite in 1935 and merged Austria, Sudetanland, Bohemia, Moravia and Slovakia in her territory in 1939.

Greater Germany: It included Germany proper, Austria and the Sudetan land. By acquiring Austria and the Sudetan land, Germany increased her territory by 25 p.c. and population by 15 p.c.

Sudetan land, formerly a part of Czechoslovakia, was acquired by Germany in October, 1938. It has an area of 11,000 square miles with a population of 3½ millions. There are rich deposits of coal, iron-ore, zinc and graphite in the Sudetan land. The forests yield valuable timber.

In March, 1938, Germany annexed Austria. The Germans and Austrians speak the same language and have the same traditions and culture.

AFTER 1945:—*The country was divided in June 1945 into four zones under U.S.A., U.K., France and Soviet Union—*

each functioning in its own zone of occupation and also jointly in matters affecting Germany as a whole through a Control Council. The zones were allotted as East—Soviet Union, North West—U.K., South West—U.S.A. and West—France. The Potsdam Agreement laid it down that "for the time being no central German Government shall be established".

The Western Germany has now been made into a Republic by the U. K. and U. S. A. Governments. The Eastern Germany, however, remains separated. The West German Government is now enjoying Marshall aid for the recovery of industries. The determination, hard work and faith with which the people are working for the recovery of the industry and agriculture have already borne fruit inasmuch as the German standards of living and consumption are almost upto pre-war.

Austria

Austria is a small mountainous state, with a population of 6 million. The relief of the country does not permit easy cultivation, and much of the food-stuffs is imported. Forests are important for supplying raw materials to the paper, pencil and cellulose industries of the country. Lignite, iron, coal, salt and manganese are found. Metal industry is important. Other industries are connected with the manufacture of musical instruments, motor cars and leather goods.

The foreign trade is entirely dependent on foreign ports as the country has no coast-lines.

Vienna, the capital, is an important educational, commercial and industrial centre. *Graz* is noted for iron manufactures. *Linz* is a railway centre.

Czechoslovakia

Czechoslovak State came into existence in 1918 after the first World War and consists of Bohemia, Silesia, Moravia and Slovakia. It has 49,355 square miles of area and 12,164,631 population (1947 census).

The location of Czechoslovakia is central and favourable for the purpose of commerce. It lies between the industrial West Europe and the agricultural East Europe and midway between the Baltic and the Adriatic seas. "Its central position in Europe gives it industrial and commercial nodality." The great physical drawback of the country is that it has no sea-board and depends on foreign ports.

The climate is somewhat maritime and somewhat continental. The rainfall is between 20 and 30 inches and occurs mostly during summer. The distribution of rain is, on the whole, favourable to agriculture.

Agriculture is highly developed and intensive farming is carried on. Fertile soil, a plentiful supply of streams and rivers and irrigation works permit cultivation of wheat, rye, barley, sugar beet and potato. The forest resources of the country are considerable, industries like matches, paper, toys, packing-case, musical instruments and barrels are dependent on their products.

Coal is found in abundance in Moravia, Bohemia and Slovakia. There is also a small output of zinc, copper, gold and silver. In the mountains of Slovakia, tin, nickel, manganese and copper are found. The oil-fields are also of growing importance.

Czechoslovakia is a great manufacturing country. The economic life and the national prosperity of the country rest on the manufacturing industries.

The manufactures may be broadly divided into three groups: (*i*) Those which obtain their raw materials in the country itself, such as sugar, alcohol, porcelain, glass-making, etc. (*ii*) Industries which depend partially on raw materials at home, such as metal industries, chemicals and leathers, (*iii*) Industries which depend entirely on foreign countries for raw materials, such as textiles, etc.

As the country has no sea-port of its own the natural lines of communication are by the Danube, Elbe and Oder. Raw cotton and raw wool are the two chief imports. Considerable quantities of food-stuffs are also imported. The chief exports are fertilizers, machinery and metals, footwear, paper, etc.

Prague (*Praha*), the capital, is the chief industrial centre. It is also a great railway town. *Brunn* (*Bruno*) is an important manufacturing town. It has large paper, match and leather works. *Pilsen* has breweries, engineering and metallurgical works. *Goblonz* is the centre of glass industry. *Zlin* is a noted centre of leather works.

Rumania

Before the first Great War Rumania covered an area of 50,700 square miles and had a population of nearly 8,000,000. In 1919 the annexation of Bessarabia, Transylvania and Bukovina increased the area to more than 120,000 square miles and the population to about 20,000,000. Nearly 75 per cent of the population speaks Rumanian.

Rumania is a grain country. Only 10 per cent of the population makes its living from industry. Small supplies of coal and iron, lack of capital and the limited home market have kept the industry in its infancy.

Land is cultivated for wheat and maize in the low plains to the east and west of Transylvania. Although the methods of cultivation are primitive, Rumania is one of the important wheat-producing areas in Europe. Sugar beets, tobacco and grapes are the secondary crops.

Rumania possesses a varied list of minerals of which petroleum, gold, copper, lead, manganese, silver, zinc and antimony are important.

In the hilly region (Ploetsi) of the eastern plains, the oil-fields produce annually more than 6,000 tons of petroleum and have made Rumania sixth among the oil-producing countries of the world. A pipe-line from these oil-fields goes to the port Constanza on the Black Sea. Iron-ore is found in Transylvania, but the output is small.

Forests of beech, resinous trees and oak are confined to the western plateau. The principal manufacturing products are wine, paper, flour and chemicals.

Bucharest is the capital and the chief railway centre. It has a population of 630,000. *Golatz* is the chief river port, situated on the Danube and is engaged in the export of wheat and oil. *Constanza*, on the Black Sea, is the chief port of the country.

France

France is very suitably situated for world trade. It is the only country that faces both the northern and the southern oceanways of Europe. Northern France faces the English Channel, one of the greatest highways of commerce. The ports in the western coast are conveniently located for carrying on trade with America and Africa. The southern ports are nearer to Asia and Australia than the British ports. The area of France is about 215,000 square miles or more than twice that of Great Britain. Her population in March 1946 was 40·5 millions.

France presents two distinct types of natural regions—Highlands and Lowlands. The highlands are: (*i*) The Armorican Peninsula (Brittany and Normandy), (*ii*) The Central Plateau, (*iii*) Alsace-Lorraine, and (*iv*) The Alps, the Juras, the Pyrenees. The Lowlands are: (*i*) The Rhone-Saone Valley, (*ii*) The Paris Basin, and (*iii*) The Basin of Acquitaine (the region between the Pyrenees, the Central Plateau and Gatine). Along the Atlantic coast, the climate is oceanic while in the eastern parts it is more or less continental. The southern France is influenced by the Mediterranean sea in that it has sun-shine and dry weather in summer and rain in winter. The northern France is in the belt of the westerly winds. The mean annual rainfall in France is 30 inches.

Economically the most striking thing about France is that she is virtually self-contained. France remains largely an agricultural country and imports little for the subsistence of her people. Nearly half the population of the country is engaged in agriculture. Because of her varied topography and climate, she has the greatest variety of agricultural products. Cereals form the most important crops, and of these wheat stands first. Fruits are important in the southern part of the country where lemons, oranges, grapes, olives and figs are abundant. Silk worms thrive best in the mulberry trees, France being one of the leading producers of silk.

France is self-sufficient in her requirements of pork, butter, animal fats and sugar and has exportable surplus in fresh fruits, vegetables, dried fruits, cheese and wine. She is deficient in oats, maize, vegetable oil, potatoes and dried vegetables.

Mining. The mineral wealth of France is of considerable importance. *In iron resources, France is the leading country in Europe.* The rich iron deposits of Lorraine give France an unlimited supply of the mineral. Lorraine ores are of low grade and contain about 40 per cent of iron. Their great importance lies in the fact that they are found near the German, Belgian and French coal-fields and the great industrial market of Europe.

Iron-ore is also found in Normandy* and Brittany in the north and in the Pyrenees in the south. *But the country, generally speaking, is poor in coal.* The most important coal-field lies in north-east near Lille. Other fields exist around St. Etienne in the middle near Le Cru Sot and in the Rhone delta. A little coal is also found at Alais in the south. The total supply of coal cannot meet the requirements of the country. Recently a petroleum field has been discovered in the south-east of France and drilling has already begun at St. Marcel. *France offers unique opportunities for the great development of hydro-electricity.* The manufacturing industries and transport of the southern side can be served by water-power. The water-power resources of France are more evenly distributed and less vulnerable than coal-fields ; the main supply comes from the Pyrenees and from the Alps. So far very little has been done in this direction. The inadequate supply of coal and the meagre development of water-power cause much of the iron-ore to be exported. She is the world's largest producer of bauxite from which aluminium is made. Alsace has large deposits of potash. After China, France is the largest producer of a less important ore, antimony.

Manufactures. Although one of the greatest industrial countries of the world, France has not been industrialised to the same extent as Great Britain. *The French manufactures are characterised by richness of quality, elegance of design and artistic finish.* In the manufacture of such goods as beautiful fabrics and laces, porcelains, jewellery, millinery, ladies' gowns, toilet goods, etc., France has no superior.

The manufactures of France are (*a*) textiles, (*b*) iron and steel goods, (*c*) wine, (*d*) luxury goods. France is the fourth textile-producing country in the world. The turnover of this industry in 1947 was valued at 311 milliard francs. The strength of the textile industry lies in the production of popular articles and luxury style goods. Among the textiles, wool, silk and cotton deserve special notice. The cotton textile industry of France is two hundred years old and was first established in

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* By the discovery of large deposits in Normandy, the reserves of iron-ore have been greatly increased, but the coal-fields are still inadequate for the need of the country. In these circumstances it is not surprising that France should take careful stock of the water-power which it possesses in the Alps, the Pyrenees and the Cevennes.

Alsace. Even to-day, Alsace is a great centre of production of high-quality goods. The northern coal-fields and the Rouen districts, both in the Paris basin, produce cotton goods of superior quality with American raw cotton. The manufacturing centres are Lille, Amiens, St. Quentin and Rouen. In spite of the scarcity of raw materials and war damages, the textile industry has almost reached pre-war level.

The northern coal-field is also important for woollen industry. In addition to the local supply from Champagne and Picardie, a considerable quantity of raw wool is brought from Argentina, Australia and New Zealand. The woollen centres are Roubaix, Rheims, Amiens and Lille.

France is one of the leading silk-manufacturing countries of the world.* In the Lyons district of the Rhone Valley, where mulberry trees are abundant, the silk industry is highly centralised. Power is obtained from the St. Etienne coal-field and the hydro-electric installations. The great development of the silk industry has necessitated the import of raw silk from China, Japan and Italy.

After the acquisition of Lorraine from Germany in 1918, France developed her iron and steel industry to a great extent. France now ranks fourth in steel production after U. S. A., U. S. S. R. and U. K. Her steel production in 1948-49 was 8 million short tons. Coal is imported from the Ruhr area for the Lorraine district. The iron industries are concerned with the production of motor cars in Clermont, locomotives in St. Etienne and textile machinery in Lille.

Production of *electrical goods* occupies a very important place in French economy. About 180,000 persons were employed in 1948 in this industry. Production is now 150 per cent. over the 1938 level. About one-sixth of the products is exported.

France has also developed a large *ship-building* industry, and her shipping tonnage gives her the fifth place in the world. Marseilles and the tidal estuary of the Seine are the two important ship-building centres.

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* Sericulture was introduced into Southern France about the year 1200, and more especially in the districts of Southern Cevennes, the valley of the Rhone Province, etc. After 1309, the silk industry made marked progress when the Italian workers settled in France.

France is the greatest wine-producing country in the world. The chief centre is Bordeaux.

In the field of *chemical production,* France in 1948 surpassed the output level of 1938. The products are sulphuric acid, carbonate of soda, carbide of calcium, nitrate fertilizers, super-phosphate, colouring products, tanning products and colours and varnish. The output in each of these except colours and varnish is on the increase.

The recovery of the French industry after the World War II is on the way, although lack of power is still affecting the production. At present only 86 per cent. of the total requirements of coal is made available by production and import. France, like many other European countries, suffers from the acute shortage of certain refractory products which are indispensable for coke furnaces.

French Communications

A country's economy is very much dependent on its means of communications. In 1938, the *French highway* system was as follows :

Main roads	50,000	miles
Secondary roads	150,000	,,
Local roads	220,000	,,

The French commercial aviation was the fifth in the world in the matter of traffic and third as regards the length of air lines in the world. At the end of the Second World War, there was practically nothing left of the air transport in France. Soon thereafter, France made striking progress.

	1938	1945	1946	1947	1948
Miles covered (in millions)	8·7	8·1	15	26	35
Passengers transported ..	109,000	120,000	307,000	535,000	834,000
Passengers-miles (in millions).	46	76	214	430	669
Merchandise transported (freight and postage in tons).	2,500	4,445	10,149	18,550	53,300
Merchandise-miles (in million ton-miles).	...	...	...	75	149

The inland waterways of the country play an important part in the movement of goods from one part to another. The rivers are connected with one another by canals and thus provide a complete system of waterways. The canals and rivers are particularly important in the north-east and in the central region where the traffic includes coal, building materials and agricultural products. The important rivers are the Seine, Oise, Meuse, Saone, Rhone, Rhine and Loire. The combined mileage of canals and navigable rivers is more than 5,400 miles. Many of the rivers of France are quite free from tolls. The Rhone *has a rapid current and in many places it reaches 12 miles*

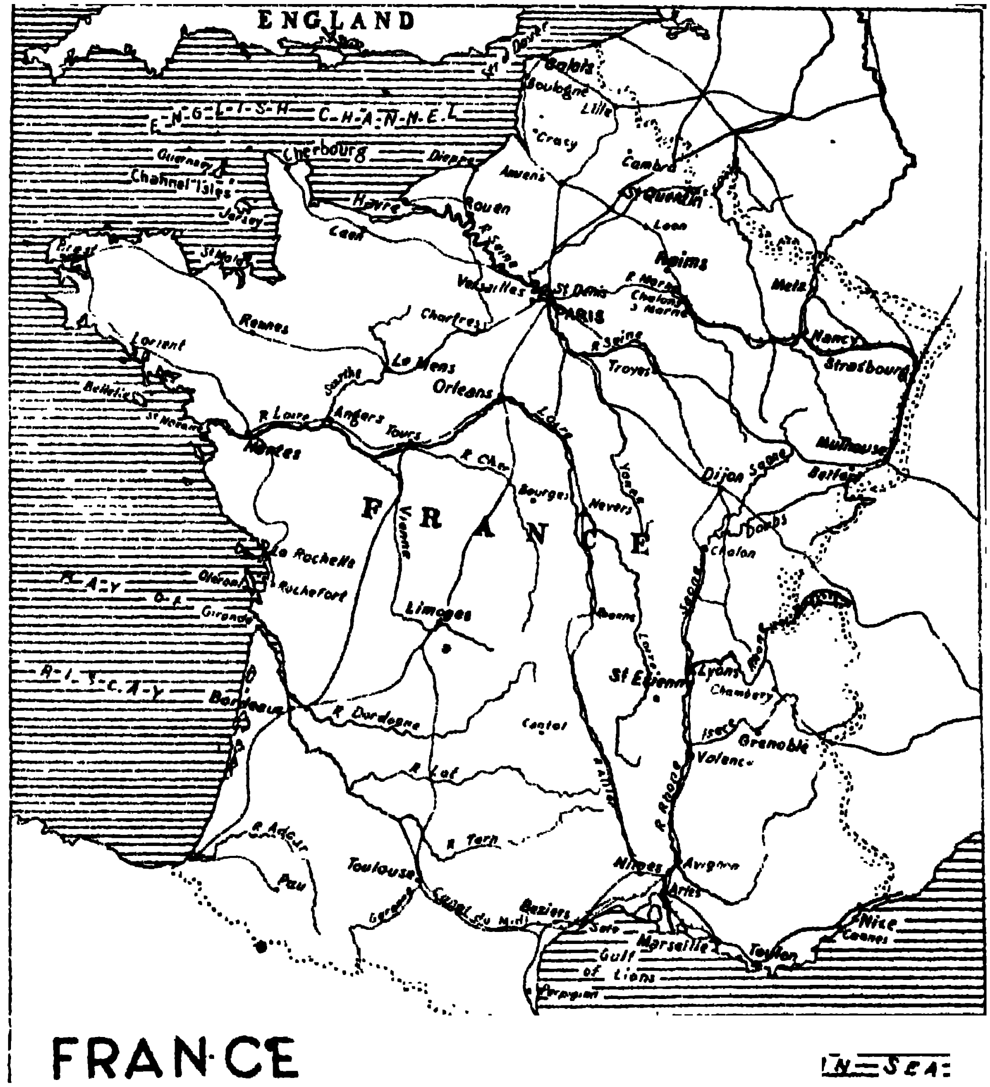

FIG. No 65.

per hour. A scheme was formulated by the French Government to harness the waters of the Rhone and its tributaries with the following objects: (*a*) The generation of hydro-electricity. This will save an annual consumption of six million tons of coal. (*b*) Irrigation. During the hot and dry summers the Lower Rhone valley would profit by irrigation. The length of the Rhone is 309 miles. "It is important not so much for navigation as for the fact that its valley forms the best natural highway through the mountains of Southern Europe. Consequently, it has always served as an important avenue of trade between the northern and southern portions of the continent." The Seine with its tributaries provides the best water transport system in France. It is 480 miles long. It rises in the highlands, west of the Saone valley and takes a westward course to Paris.

The length of the river canals is a little more than 3,000 miles. The important canals are: (*a*) the East, connecting the Meuse with the Moselle and Saone, (*b*) the Nantes-Brest canal, and (*c*) the Loire canal. There are certain drawbacks in the French waterways. These are (*i*) want of good inland ports, (*ii*) slowness of transit, (*iii*) great length of the journey, and (*iv*) the inadequate facilities in some of the canals for the transference of goods to or from the railways.

Foreign Trade

France is the only great manufacturing country in Europe that is almost self-sufficient in food products. Cotton, wool, oilseeds, hides and skins are its chief imports. From the French colonial possessions* sugar, rice, coffee and wild rubber are imported. Its principal exports are wine, dairy produce, bauxite, textiles, iron ore, chemicals, leather, automobiles and sugar. French exportations of glass works are also important.

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*France has a great *Empire* both in size and population. The area of the Empire is 4 million square miles, and its population over 107 million. But in comparison to the British Commonwealth, it is far less productive, some parts being barren and only sparsely populated.

French possessions: Syria, Indo-China (Annam, Cambodia, Cochin-China, Tongkong, Laos), Africa (Algeria, Tunisia, Senegal, French Sudan Guinea, Ivory coast, Dahomey, Mauritania, Niger, Equatorial Africa, Cameroon, Togo, Reunion, Madagascar, Mayotee and French Somaliland), America (St. Pierre, Guadeloupe, Maritinique, Guiana), Oceania (New Caledonia and Tahiti).

The main customers of French glass works are U. K., Belgium, Sweden, Switzerland and U. S. A.

At present the share of manufactured goods in the total export trade of France is 72 per cent. as against 50 per cent. in 1938.

(In million Francs)

	1938	1949
Export	30,590	782,022
Import	46,065	921,794

About 40 per cent. of her exports go to her colonies. The other buyers, in order of importance, are U. K., Belgium, Argentina, Holland, Germany and U.S.A. The chief imports are from French colonies (30 p.c.), U. S. A., Germany, Australia, U. K. and Belgium.

TRADE CENTRES. *Paris* is the political and commercial centre of the Republic. The railways radiate from Paris. *Havre* is situated at the mouth of the Seine and is a great seaport. It has extensive trade with North and South America. *Lyons* is situated on the Rhone and is the largest silk manufacturing city of the world. Raw silk is obtained from the Rhone-Saone valley, but the greater part is imported from Italy, China and Japan. The silk industry is carried on in cottages and small factories within the city. In the industrial suburbs of Lyons a great development of artificial silk manufacture has taken place. Already Lyons produces about 80 per cent. of the artificial silk manufactured in France. *Marseilles*, on the Mediterranean coast, is the most important port of France. With its local supply of olive oil and easy importation of vegetable oils from the Tropics, Marseilles has become one of the world's chief centres for the manufacture of soap, margarine and candles. *Bordeaux*, on the west coast, is the chief centre for the exportation of wine. Within recent years great development has taken place in ship-building. *Rouen*, situated on the Seine, is a great cotton-manufacturing town. *Lille*, on the North-East coal-field, is a town noted for linen manufactures. Cotton is also manufactured here. *St. Etienne*, near the great coal-field of the middle, is a great industrial town. The chief industries are those of iron and silk-ribbon goods. *Dunkirk* is an important port on the northern coast of France. It has extensive trade with South America.

Italy

Italy's position is very favourable to commerce. It has sea on three sides and stands in the centre of the most important inland sea in the world.

Geographically, Italy presents three major divisions, *viz.*,

(*i*) The Northern plains and the mountains.
(*ii*) Peninsular Italy.
(*iii*) The islands.

The Northern plains have more or less the continental type of climate, as these are shut off from sea influences by the encircling mountains. Peninsular Italy has the Mediterranean type of climate.

Although Italy is a densely populated country, the concentration of population is the greatest in the northern plains where the soil and the climatic conditions are highly favourable to the cultivation of a variety of crops. Vine, wheat, maize, rice, flax, hemp and sugar-beet are cultivated with the help of irrigation. Rice is cultivated in the valley of the northern provinces on large-scale farming. With 336,000 acres under rice cultivation mostly distributed in the Piedmont-Lombardy zone, Italy today ranks as the foremost rice producer in Europe. About two-thirds of the total production of rice in Italy are consumed internally, while one-third is exported mainly to Argentina, Switzerland, Germany and France. A large cultivation of vine throughout the country has placed Italy in the second position among the wine-manufacturing countries. The Mediterranean climate of peninsular Italy favours the growth of fruits. Olive, lemon, orange, apricot and fig are extensively raised. Mulberry trees are also found in the south in large numbers as a result of which Italy has become the largest silk producer in Europe. With the exception of a few mountain areas, the mulberry can be grown in all parts of Italy. The important regions are Lombardy, Venetia, Piedmont, Emilia, Tuscany, Umbria and Sicily. Mulberry was known in Italy as a fruit tree in very ancient times. In some parts of the country it was looked upon only as a fruit tree as late as 1300 A.D.

The mining industry is most developed in Sicily, in Tuscany, in Sardinia, in Lombardy and in Piedmont. Of minerals sulphur is the most important. It is found chiefly in Sicily. Iron ore is obtained from the island of Elba and

Tuscany. Italy is the largest producer of mercury. The chief mercury mines are the Monte Amiati in Tuscany, and the Idria.

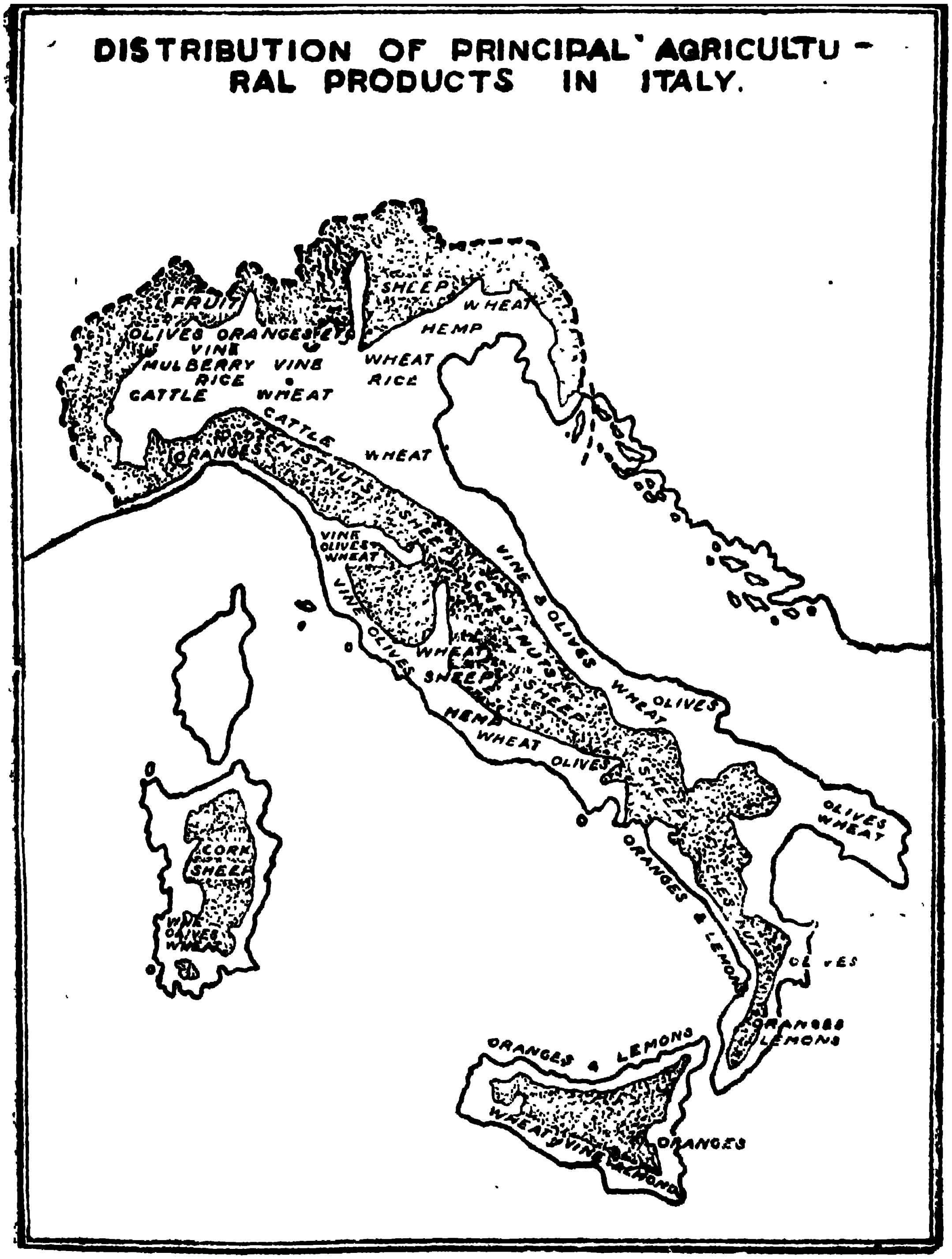

FIG. No. 66. Note the concentration of cultivation in the northern plain.

Marble stones of the best quality are found in the country. Coal is generally scarce ; hydro-electricity is developing. The relief of the country and the innumerable streams offer unique opportunity for the development of water-power. Other minerals found in Italy are lead, zinc, bauxite and manganese.

Italian manufactures are developing with remarkable rapidity. Italy has certain advantages. These are: (*i*) cheap labour, (*ii*) local market, (*iii*) water-power, (*iv*) State support, (*v*) skill and enterprise of the people. *The characteristic manufacturing industries are mainly those of an artistic or semi-artistic nature.* Glass-works, lace goods, earthen wares and mosaics, marble-works, straw plaiting and cutlery are good examples of Italian manufacturing skill. Large-scale manufactures of cotton, woollen and silk goods are important. Wine-making, ship-building, and iron and steel production are also important. Italy occupies an important place in world textile industry and trade. During 1920 and 1930 its position as an importer of cotton was fifth in the world, while it was the world's sixth importer of wool. On the export side, it occupies a still more enviable position. Normally, it is the world's leading exporter of raw hemp and rayon yarn, second of cotton yarn and third of raw silk. The textile industry is the main source of employment in the country. It is estimated that 470,000 persons are employed in the textile industry, while about 380,000 are employed in complementary industries. About 25 per cent. of the textile production is exported to foreign countries. Thus the main key to the rehabilitation of Italian economic life today lies in the rejuvenation of its textile and complementary industries. *Italy holds a very important place for the production of artificial textile fibre,* being Europe's largest producer. In 1937 Italy contributed one-sixth of the world's total output of artificial silk. The rise and growth of the artificial silk industry has been favoured by the following conditions: (*a*) abundant supply of electric power, (*b*) cheap raw materials, (*c*) skill of the technicians, (*d*) presence of a large body of workers specialised in silk reeling and manufacturing. The leading markets for Italian rayon are those of Germany, Holland, Denmark, India, Peru, Chile and Brazil. Among the various sectors of Italian production, the automobile industry is undoubtedly the most flourishing. Production of automobiles and other auto-vehicles is steadily on the increase. The annual production is about 100,000 motor vehicles.

The railways of Italy are well developed and connect the ports with the interior and Central Europe. The length of railways in 1947 was 23,222 km. The rivers are many ; but those which are navigable are confind mostly to the great northern plain. These are the Po, Ticino, Adda and Adige. In the south the only navigable rivers are the Tiber and the Arno. Italy's roads totalled 174,268 kilometres in 1942.

Italy has a little more than 45 millions of people. As too many people *depend on the present resources of the country,* Italy is over-populated. *Italy is poor in natural resources.* There is practically no fuel. Between 9,00,000 and 10,000,000 tons of coal must be brought from outside, besides oil. Production of iron-ore is not sufficient for the requirements of the country. Nor is she self-sufficient in agricultural products. Cotton, wheat and corn must be imported. Thus, there is widespread poverty in Italy.

Milan is situated at the foot of the Alps. It is the greatest city of the northern plain. The silk industry, for which Italy is famous throughout Europe, is localised mainly in Milan. It has also engineering industries. *Rome* is the capital of modern Italy and one of the oldest cities of the world. Its population exceeds one million. *Naples* is situated on an excellent bay on the south-western coast of peninsular Italy. It is a great ship-building centre. The industries of the port use hydro-electricity. *Turin,* a city of the northern plain, is famous for the manufacture of motor cars. *Trieste,* at the eastern end of the northern plain, is an important port. It carries on considerable entrepot trade for the countries of Central Europe. It is now a free territory under the United Nations. *Fiume,* on the eastern side of the Istrian peninsula, is a great port and a collecting centre. *Genoa* is a great sea-port of the northern plain. *Venice* and *Genoa* were once very important trading centres of the world. They acted as entrepots ; rich products of the East were brought to these places for distribution to Europe. Their importance declined with the opening of the Cape Route.

The principal imports of Italy are cotton, iron-ores, wool, mineral oil, coal, timber, sugar, coffee and tea. The exports include fruits and vegetables, cotton, silk and rayon, motor cars, wine, etc. Normally, Italy has an adverse balance of trade which is made up by receipts from shipping, tourist expenditure and remittances from Italians abroad. Her value of import in 1949 was 844,800 million lire. In the same year, her exports were for 632,300 million lire. About 40 p.c. of her imports come from the U.S.A. In the matter of export, Argentina is the most important buyer, closely followed by U. K.

Poland

Poland was an independent state for many centuries. It was partitioned by Russia, Prussia and Austria towards the close of the 18th century. Thus Poland disappeared from the political map of Europe till 1919. She became an independent Republic at the end of the First Great War, when the Polish territories, hitherto ruled by Germany, Austria and Russia were liberated and united. Her geographical position practically made her a buffer state between Germany and Russia. During the Second World War, Poland was again absorbed in Germany and Russia. Once again Poland is independent but with changes in boundaries. The eastern Poland comprising an area of about 70,000 square miles is now Russian. This loss of Poland has been somewhat compensated by the acquisition of Danzig and southern East Prussia which gave 39,000 square miles to Poland.

The country is surrounded by land-frontiers. It has access to the sea-coast only by the Polish Corridor where Danzig and Gdynia stand on the Baltic coast.

Poland has no natural frontier excepting the Pripet Marches on the east and the Carpathians on the south. The climate is continental, and the population is nearly 35 millions, of whom 69 per cent. are Polish. The remainder is composed of Ukrainians, White Russians, Jews and Germans.

It is a farming country and over 60 per cent. of the total population are engaged in agriculture, forestry and fishing. Rye and potatoes occupy more than half of the total cultivated area.

Although the country is very rich in minerals, only 15 per cent. of the total population are engaged in mining. Upper Silesia produces annually more than 40 million tons of coal of good quality. The Galician oil-field at the foot of the Carpathians yields about 500,000 tons of petroleum annually. Zinc and salt are also found. Upper Silesia also raises lead and iron-ore. The forests, which are an important source of wealth, cover more than one-fourth of the land. The manufacturing industries have developed in the area around Lodz, Bydogoszez, Silesian coal-field, Bailystok, Lwow and Warsaw. *Lodz* is an important cotton-manufacturing centre. Heavy metal industries are mainly concentrated in Upper Silesia. *Warsaw* is one of the oldest and most important towns of Poland. From this great city roads and railways radiate in all directions. *Gdynia* is situated on the Gulf of Danzig, a little west of the mouth of the Vistula. It lies just outside the territory of Danzig and the reason for its development was Poland's dissatisfaction with the establishment of Danzig as a free city which did not meet her requirements. Danzig, a free city in 1938, and then under German occupation till 1945, is now purely a Polish port.

The Baltic States

Immediately after the World War of 1914-1918 four states were created out of the former Russian Empire. These states are *Esthonia, Latvia, Finland* and *Lithuania*. The economic progress in these states is extremely slow. "Roads are poor, railroads few, wages low, poverty widespread and life generally an uphill struggle." Esthonia, Latvia and Lithuania are now included in the Soviet Republic.

Esthonia is the most northerly of the Baltic States. It occupies a very strategic position on the Gulf of Finland. Until 1918 it was one of the Baltic provinces of Russia. In September, 1939, Russia again established military and naval bases at certain ports of Esthonia. Agriculture is the main industry. Efforts are being made by the State to develop manufacture and transport. *Tallin* is the chief port and town.

Latvia. Along with agriculture, cattle-rearing and lumbering are carried on. Fishing is an important occupation. *Riga* is the largest city of the state. It is the chief sea-port, noted also for manufactures.

Lithuania. Manufacturing industry is developing rapidly side by side with agriculture. The important industries are flour-milling, distilling, breweries, tanning and saw-works which are run by water-power. Forests provide timber and supply raw materials to match-making and paper industries, Rivers are navigable. *Kaunas* is the seat of the government. *Memel* is the chief port for the outlet of goods.

Finland is bounded by the U.S.S.R. on the east, the Baltic Sea on the south, Sweden and Norway on the west and the Arctic Ocean on the north. It contains a population of about 3½ million, most of which is concentrated in the southern provinces. More than half of Finland is covered by forests ; the chief trees are the fir, pine, maple, ash and oak. Her great wealth of timber is the most important factor in her industrial development. Industry is almost entirely based on forest products. There are more than 450 saw-mills in the country. The forest products are paper, newsprint, dry cellulose, mechanical pulp and cardboard. Finland is now the largest supplier of plywood in the world. Forests cover large areas, and provide raw materials for many industries. Agriculture and dairying are the two important occupations. Reindeer supplies milk, meat and clothing. Fishing is of growing importance: it is favoured by the existence of many good harbours and indented coast-lines. The Finns are fairly progressive. The country suffers from lack of communication and minerals. The chief exports are timber, pulp-wood and paper. *Helsinki,* the capital, is a port and a manufacturing centre. *Viborg* is an important port noted for the export of timber. *Turku* is a shipping centre.

QUESTIONS

1. Point out and account for the chief features of the foreign trade of Britain. Name the four most important commodities of import and export trade respectively and the ports which particularly deal with the same. (Cal. Inter. 1934).

2. Describe carefully and explain the importance of the inland waterways of France. (Cal. B. Com. 1925, 1949; Cal. Inter. 1951).

3. Describe the distribution of linen industry of Northern Europe excluding Great Britain and Ireland. Where do the raw materials come from? To what extent is this industry dependent on the supply of raw materials from India?

4. On an outline map of Europe mark the places containing important deposits of iron-ore. Indicate also the region from which coal is obtained near the iron-ores. (Cal. Inter. 1928, 1937, 1943).

5. Is it environment or man that has made the Ruhr basin the greatest manufacturing region of Germany? What are natural environmental conditions? (Delhi Univ. B.A. Hons. 1951).

6. Compare Scotland and England as regards (*a*) physical features, (*b*) production and (*c*) distribution of population. (Cal. Inter. 1931).

7. In what part of Great Britain are all branches of the woollen industry most largely situated? Point out the local conditions favourable to it there and name three of the chief towns engaged in the district. (Cal. Inter. 1925).

8. Account for the localisation of the cotton textile industry in Lancashire. Also describe the present condition of the British cotton industry. (I. I. B. 1937; Cal. Inter. 1936, 1940).

9. Consider the position of France with regard to her supplies of (*a*) fuel and (*b*) water-power. (Cal. B. Com. 1932).

10. State briefly the prospects of France with her colonial Empire, becoming a self-supporting economic unit. (Cal. B. Com. 1932).

11. Name the three principal manufacturing industries of Great Britain and give reasons for their location. (Cal. Inter. 1936, 1949).

12. What are Great Britain's sources of supply of food-stuffs and textile raw materials in normal times, and how have these been affected by the war? How is Great Britain trying to counteract the shortage of these commodities? (Cal. M. Com. 1941).

13. Describe the position of the principal coal-fields of Germany particularly as regards access to navigable waterways. Also name the chief manufacturing industries of these coal-fields.

14. Give an idea of coal and iron regions of Europe, and the industries which have been established there. (Cal. Inter. 1938)

15. Examine in detail the geographical factors which have contributed to the commercial and political superiority of Great Britain. (Cal. B.A. 1942).

16. Describe and account for the distribution of population in Great Britain. (Cal. B.A. 1942).

17. Describe the position of continental Europe, excepting U.S.S.R. and the Iberian peninsula, as a self-supporting economic unit. This region was known to be a very large consumer of tropical and subtropical food-stuffs and raw materials. How is the demand for these commodities being met now? (Cal. B. Com. 1943).

18. Examine the coal resources of Great Britain and show how these have helped the development of her industries. (Cal. Inter. 1943, 1945).

19. Draw an outline map of Great Britain and indicate the places where her industries are located. (Cal. Inter. 1944).

20. Write a brief note on the development of inland water communications in Germany. (Cal. Inter. 1941, 1951).

21. Suggest a division of France into natural regions. Give full reasons for your answer. (Cal. Inter. 1943).

22. Compare the relative advantages which Great Britain and U.S.A. have for the development of the steel industry.
(Cal. B. Com. 1947).

23. How is it that the cotton textile industry has grown up both in the United Kingdom and Japan, when both depend on other countries for raw cotton and markets? (Cal. B. Com. 1947).

24. Comment on the present position of the U.S.S.R. in respect of agricultural and mineral resources. (Delhi B. Com. 1951).

25. Discuss the geographical factors influencing the growth of Britain's prosperity and trade. Do you think Britain can still count on those factors? (Cal. B. Com. 1949).

26. What are the principal seats of ship-building industry in the United Kingdom and what are the geographical advantages for the industry enjoyed by them? What geographical circumstances tended to deprive the Thames of the high rank it once held in the industry?
(Delhi Univ. B.A. Hons. 1950).

27. Describe the principal coalfields of U. K. and establish their connection with British manufactures. (Cal. Inter. 1951).

28. "Britain is rich in mineral wealth, specially in coal." Many other countries are equally fortunate in this respect. But how is it that Britain has made more industrial progress than others?
(Cal. B. Com. 1951).

CHAPTER XI

NORTH AMERICA

North America is the third largest continent and embraces nearly one-seventh of the land surface of the globe. It has an area of 9 million square miles with a population of 190 million. The continent almost touches Asia in the north-west and comes nearest to Europe in the north-east. The situation is ideal for commerce inasmuch as both Europe and Asia can be approached conveniently by waterways. The trade with Asia has been further helped by the construction of the Panama Canal. North America has a variety of climate which accounts for the growth of agricultural products like wheat, cotton, tobacco, sugar-beet, sugar-cane, rice, hemp, maize, etc. Minerals are abundant in the western mountains and in the Eastern Highlands. In some of the mineral products, she is the leading producer. Rivers and lakes, on the whole, provide excellent waterways.

The main divisions of the continent are the following :-

(I) The Dominion of Canada.
(II) U.S.A. including Alaska.
(III) Mexico.
(IV) Central America.
(V) West Indies.

Canada

The Dominion of Canada consists of ten provinces of Nova Scotia, New Brunswick, Prince Edward Island, Quebec, Ontario, New Foundland, Manitoba, Saskatchewan, Alberta and British Columbia together with the North-West Territories and the Territory of Yukon.* The area of the country is 3·5 million square miles, and the population in 1950 was 13,845,000. In spite of the large size of the Dominion, many parts are not suitable for settlement because of unfavourable climate, relief and soil. Yukon and the N. W. Territories have practically very little scope for development. The population of Canada is practically concentrated in a fairly narrow zone, bordering the U.S.A. The lowlands lying between the lakes of Erie

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* In April 1949, New Foundland became a province of Canada.

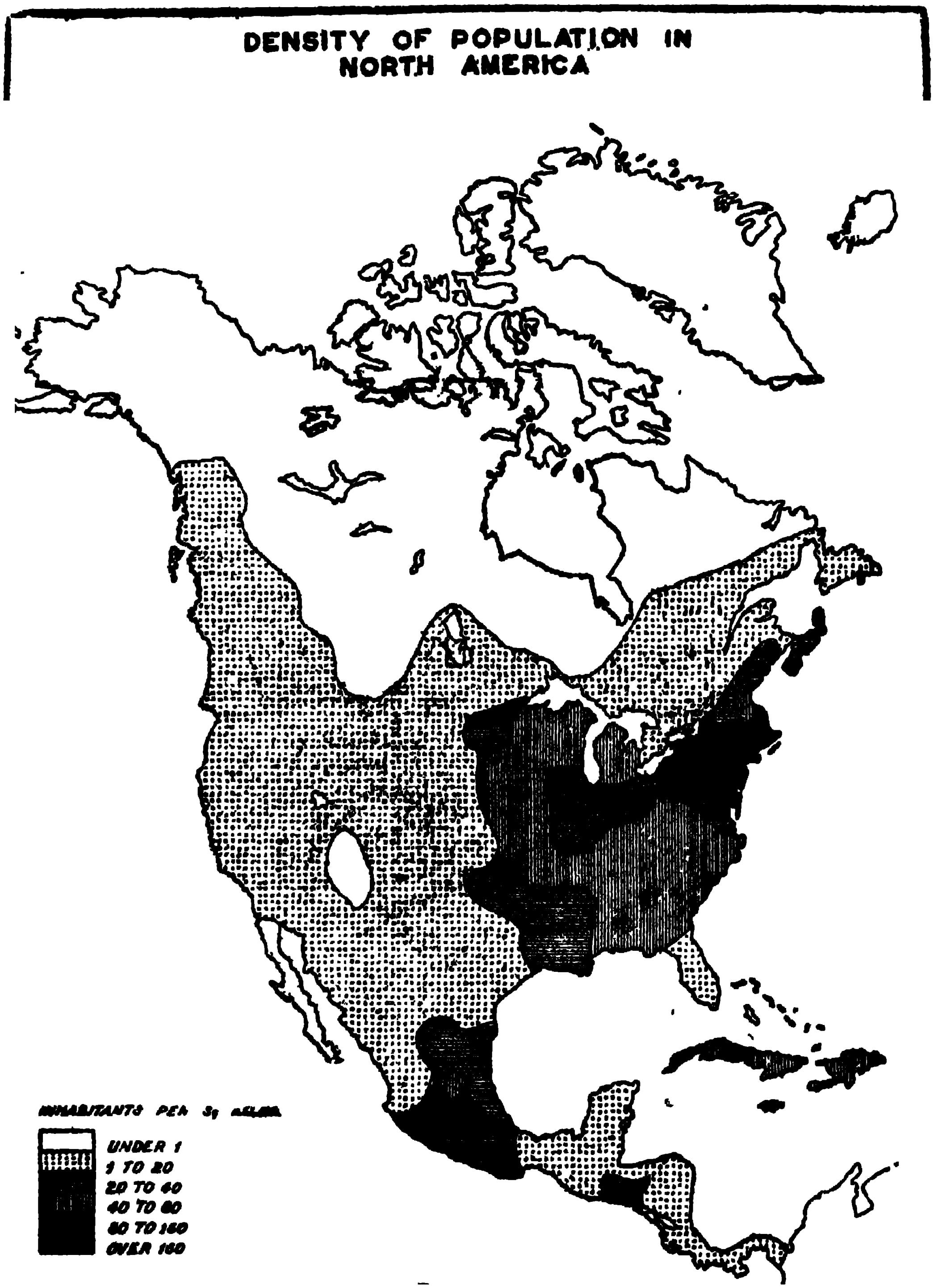

FIG. No. 67.

and Ontario and the St. Lawrence river on the south and Laurentian shield on the north contain about 50 per cent. of the total population of Canada. The greatest density is found in Ontario along the northern shores of both lakes and along the Laurentian lowland of Quebec. Nearly half the population lives in the seventy towns of Quebec and Ontario. The Canadian population consists of many races which, in spite of living side by side, have not yet merged into a single nationality. The principal races are French (28 p.c.), English (26 p.c.), Scotch (13 p.c.), Irish (12 p.c.), and German (5 p.c.). They nourish their own language and individuality. The idea of nationhood is the only cause of happy relations among these races.

The natural resources of Canada are very great. In agriculture, mining, lumbering, fishing and ranching it occupies the most important position in the British Empire.

Fishing is an important industry of Canada, which is carried on in the banks, shores and rivers. Nova Scotia and New Brunswick are the two important states noted for sea-fisheries. The indented coast-line provides plenty of small harbours, the forests supply timber for the fishing boats, and the shallow banks off the coast supply the fish. Cod, halibut, mackerel and herring are the chief catches. On the east coast also is found the lobster fishery—much the largest in the world. On the western side of Canada, river fisheries are very important ; in that region salmon is caught in Fraser, Columbia and Skeena rivers. This region is one of the world's big salmon fisheries with catches sometimes running to as much as 190 million lbs. in a year. Some valuable sea fisheries include herring, cod and halibut on the western side, where Prince Rupert is the chief centre. The rivers and the great lakes of Canada also contain fish which are mostly consumed in the country. The number of persons employed in the fishing industry in 1949 was about 82,600. Canada produces fish three times as much as she can absorb in her domestic markets. Consequently the development of foreign markets for her fish is a matter of outstanding importance. The annual catches of fish from the fishing grounds on the Atlantic and Pacific coasts and inland waters come to about 1,300 million lbs. The landings include some 70 different kinds of fish and shell-fish as well as some non-food species of commercial value.

Although manufacturing industries have developed to a considerable extent in Canada, the country is mainly agricultural. Agriculture is the most important single industry within the Canadian economy. Canadian agriculture produces a wide variety of products, but among these the most important group is that of grain of various types.

There has been a great expansion of agricultural output in Canada in recent years. The factors responsible for the expansion are the high level of prices of farm products, good weather, rapid rate of mechanization in farm operations, increased research in processing and preservation of foods and plentiful supply of fertilizers. The extension of railways has also greatly facilitated the cultivation of crops in the arable lands.

PRODUCTION OF CROPS IN 1950

(in 1000 bushels)

Wheat	461,720	Flax	4,540
Oats	420,328	Mixed grains	55,928
Barley	171,328	Other grains	19,922
Rye	13,346	Potatoes	53,518

The main wheat belt of Canada is about 200 miles wide and 700 miles long and stretches diagonally across the southern parts of Manitoba, Saskatchewan and Alberta. Sowing takes place in May and the harvest is over by September. The average yield of wheat per acre in Canada in a normal season ranges from twelve to fourteen bushels which is considerably less than that obtained by the U.S.A. farmers. But wheat is grown on a very large scale in Canada and labour-saving devices greatly reduce the cost of production and handling. Recently wheat cultivation in the Dominion has undergone some change. The wheat belts are fast moving to the west. Saskatchewan which supplied 50 per cent. of the Canadian wheat even in 1926, now raises less than 30 per cent. To-day, Alberta closely rivals the former. The stabilisation of prices, grading and supply are generally controlled through "wheat

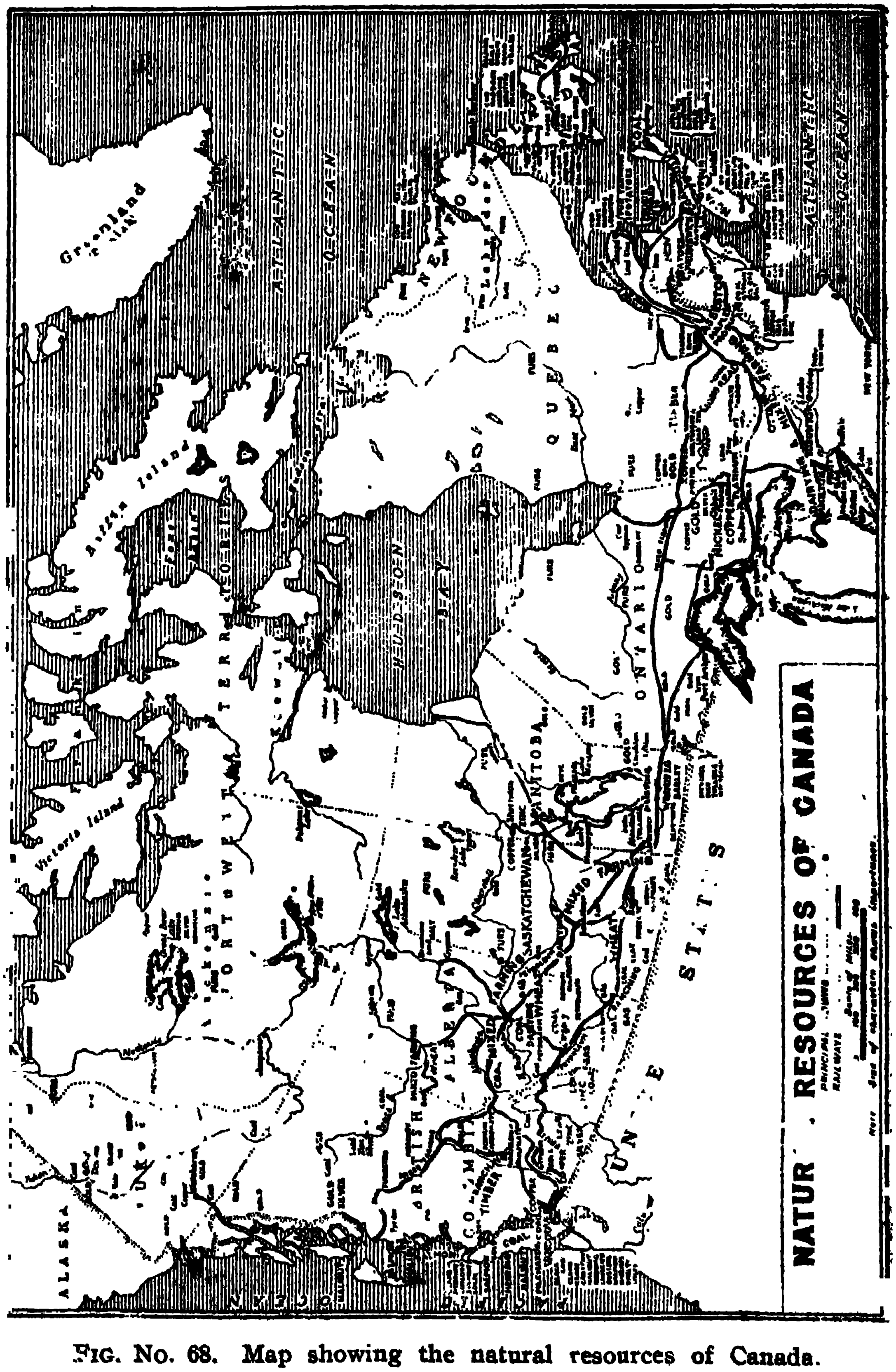

FIG. No. 68. Map showing the natural resources of Canada.

pools". Annual production of wheat averages five times the total requirements for domestic use, and this surplus of production over requirements has made Canada one of the leading wheat-exporting countries of the world.* About three-fifths of the Canadian wheat are exported and the destinations are U.K., U.S.A., Africa and the Far East. The wheat centres are Port Arthur, Fort William, Winnipeg and Montreal. The importance of Canadian wheat is not judged by exports alone. Livestock is also fed with wheat in Canada. Oats are raised mainly in Saskatchewan, Alberta, Ontario, Quebec and Manitoba. Nearly 11 million acres of land were under the cultivation of oats in 1949. Manitoba, Alberta and Saskatchewan account for nearly 90 per cent. of the barley production of the Dominion. A little above 1 million acres of land is under rye cultivation, and the important provinces are Saskatchewan, Alberta and Manitoba of which Saskatchewan alone contributes two-thirds of the total production. Potatoes are chiefly grown in Ontario and Quebec. Of late, the outstanding agricultural development has been the rapid and pronounced expansion in the production of livestock and livestock products to meet the unprecedented export and domestic demand after the World War II. Poultry, meat, eggs, milk and milk products have increased in Quebec and Ontario.

Canada has reached the position where it is one of the leading producers of minerals. In some respects it is the most unique of all mining countries. Her minerals are vital not only to North American continent but to the rest of the world also.

In 1949 the value of mineral production in Canada was about $900 million from about sixty different substances. Extensive exploration and development programmes are now under way in large petroleum, iron and titanium fields. Nova Scotia, British Columbia, Quebec, Ontario, Alberta and Yukon Territory are the chief mining districts. *Canada is the third largest producer of gold in the world and contributes 7 per cent. of the world's total.* The chief gold-areas are British Columbia,

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* Canada commenced to export wheat in the seventies and in 1913 she consigned 90 million bushels overseas. In 1928 she had an exportable surplus of 365 million bushels. Since then the export figure of Canada has remained almost the same.

Klondike district of the Yukon Territory, Nova Scotia, Ontario and Quebec. In 1949 Canada had a production of 4·1 million fine ounces of gold. *The most valuable nickel mines in the world are at Sadbury in Ontario, which supply 90 per cent. of the world's total.* There are about 40 nickel mines at Sadbury in an area 40 miles long and 15 miles wide. Copper is another valuable mineral which is worked mainly in Ontario, Quebec and British Columbia. Another mineral, of which Canada supplies 95 per cent. of the world's total, is asbestos, mined in Quebec. Silver, zinc, lead and cobalt are the other minerals. Rich deposits of titanium near the St. Lawrence and of uranium in Saskatchewan and the N. W. Territory promise great things, both directly in wealth, and indirectly by facilitating bigger population in areas, now barren. Iron ore regions are mostly found in Texada, Ontario, Nova Scotia, Alberta, Saskatchewan, Rocky mountains and Vancouver Islands. The coal-fields of Nova Scotia alone furnish about 40 per cent. of the Canadian output. There is also a vast new iron field in the barren Ungara region between Quebec and Labrador. Crude oil and natural gas are obtained from Alberta at Medicine Hat and the Mackenzie basin.* In 1949 Canada produced 21 million barrels of crude petroleum.

Nearly one-third of the total area of Canada is forested and in all these, except in the north where movement is difficult, lumbering is an important industry. *Canada ranks among the greatest exporters of timber in the world.* It is the only country in the British Commonwealth with a large exportable surplus of construction lumber. Its only serious competitor in the whole world in that commodity is Scandinavia. More than one-half of Canada's lumber is supplied by British Columbia where the predominating species are Douglas, Fir, Hemlock, Spruce, Red Cedar and Pine. Structural timbers are obtained from the pines and hemlock, while cedar is important for exterior work. Spruce is used for pulp in paper-making.

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* The oilfields of Alberta seem destined to revolutionise conditions, industrially and strategically, throughout the already agriculturally rich Western Prairie zone of North America. A 1,100-mile £30m. pipeline is being built to convey the produce to the U.S. shore of Lake Superior, and another may be pushed through the Rockies to the Canadian West coast. In 1950, the first section of the pipeline was opened; this stretches from Edmonton (Alberta) to Regina (Saskatchewan) and is 439 miles long.

LUMBER PRODUCTION

(In 000 of feet Broad measure)

1938	3,768,351	1947	5,392,595
		1949	5,289,000

The northern forest belt is commercially important on the eastern side, especially in Quebec. The lumbering industry is favoured in Eastern Canada by a multitude of rivers, the very severe winters and floods in spring when the thaw comes. The timber is cut in winter and is easily dragged over the snow and ice by horses to the nearest convenient stream. The trees are bound together to form a raft and when the stream thaws the rafts are floated down the stream to the saw mills. The conservation of forest is strictly maintained in Canada. No one is allowed to cut timber without licence, and young trees are protected. The fire-protection services maintain watch-towers for reporting outbreak of fires. The great northern forests also give refuge to many fur-bearing animals. Furs and pelts of these animals are in great demand in America and Europe.

The buyers of Canadian lumber are, in order of importance, U. K., U. S. A., Netherlands, Union of South Africa and Australia.

Canada is fortunate in having large navigable waterways. St. Lawrence and the Great Lakes provide 2,000 miles of magnificent natural waterways to Canada, although they are frozen during the winter months. Large ocean vessels can pass about a thousand miles up the river St. Lawrence to Montreal, where goods are transhipped to smaller vessels. Navigation is rendered difficult at the mouth of the St. Lawrence because of constant fogs and the rapidity of the current. In addition to this system, there are many large lakes and navigable rivers. The Dominion has more than 1,600 miles of canals which connect the rivers with the lakes.

The water power development of Canada is widespread throughout the Dominion. Water power supplies more than

97½ per cent. of the electricity generated in Canada. In 1948 Canada had 10·4 million horse power of water power with 32 million horse power potential. The distribution of low cost hydro-electric power has been a vital factor in the rapid industrialisation of the country and in the attainment of a high standard of living. It provides four-fifths of the energy used in secondary industries and virtually all the power for the primary industries as pulp and paper, electro-metallurgical and electro-chemical.

The progress of Canada is due to the result of a great development of the railways, particularly in the west and north-west. Rail transportation is the main co-ordinating factor forming a background for all the accomplishments of production. Canada has now two great railway-systems: (*i*) The Canadian Pacific Railways, and (*ii*) the Canadian National Railways. Each system has a trans-continental line and a network of innumerable branch lines which have played a great role in opening up the agricultural areas of the west. The railways of the Dominion are connected with those of the U. S. A. The total railway mileage in Canada in 1949 was 57,005.

The manufacturing industries are rapidly developing. The increase of agricultural population, extension of railways, mineral wealth, supplies of water-power and the large produce from agriculture and forests will in future make Canada a great industrial country. Already her manufactured products far exceed in value the unmanufactured farm products. Though she imports from abroad some of her requirements in railway materials, farming machines, iron and steel goods and textiles, yet signs are not wanting to show that this dependence will be over in the near future with a further expansion of the manufacturing industries. Canada's vast natural resources give rise to industries like fish-canning, flour-milling, butter and cheese-making, saw-milling and paper-making. Manufactures of leather, cotton and woollen goods and the construction of iron and steel goods are the other important industries. The development of the pulp and paper industry in Canada is due to readily accessible resources of wood of superior quality for the manufacture of both paper and rayon, and to well-distributed water-power and supplies of clean, fresh water. [illegible] - 180

THE PRINCIPAL MANUFACTURING INDUSTRIES*

Groups of Industries		No. of Establishments	No. of Employees
Vegetable products	...	5912	140,785
Animal products	...	4323	102,817
Textile products	...	3204	182,408
Wood and Paper	...	13806	256,938
Iron products ...	...	2548	269,776
Non-ferrous metals	...	817	99,921
Non-metallic minerals	...	1009	40,956
Chemicals ...	...	1026	39,548
Miscellaneous ...	...	802	22,857
	Total ...	33447	1,156,006

Though so sparsely inhabited, Canada even now ranks third, in terms of volume, among the world's trading nations, and per capita enjoys a bigger foreign trade than any country.

About 52 per cent. of the total value of exports consists of manufactured goods. Raw materials account for 26 per cent.

Newsprint paper, wood pulp, meat, wheat, timber, cheese, fish, silver, bacon, gold, copper, fruits, automobiles, vehicles, farm implements and fertilizers are the chief exports. The principal imports are iron and steel goods, woollen and cotton goods, petroleum, coal, tin, rubber, cotton and tropical and sub-tropical products. Great Britain had the largest share in the foreign trade of Canada till 1914, but at present the U.S.A. occupies the privileged position.. This is because the Canadians largely employ American machinery and adopt American techniques in mining, agriculture and industry. Moreover, the Canadian consumers have much the same tastes as American consumers.

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* The Statesman Year Book, 1951.

DIRECTION OF CANADA'S EXPORTS AND IMPORTS

Exports ($ millions)

	1938	1949		1938	1949
U.S.A. ..	270·5	1503·5	Latin America	17·4	125·6
U.K. ..	339·7	704·9	Other countries	38·9	112·8
Other Sterling areas ..	103·2	310·1			
Western Europe	67·9	236·0	Total ..	837·6	2992·9

Imports ($ millions)

	1938	1949		1938	1949
U.S.A. ..	424·7	1951·9	Latin America	16·0	192·0
U.K. ..	119·3	307·4	Other countries	11·3	39·2
Other Sterling areas ..	66·8	186·8			
Western Europe	39·2	83·9	Total ..	677·3	2761·2

Halifax is the capital and chief sea-port of Nova Scotia. It possesses a fine harbour and is seldom closed by ice during winter. The harbour is six miles long and one mile broad. It provides accommodation for large vessels. Although it is chiefly a trading centre exporting fish and minerals, a considerable progress in manufactures has taken place recently, especially in sugar-refining and cotton-spinning. *Charlotte town* is the capital and chief town of Prince Edward Island. Fox-farming is an important industry. *Montreal,* in Quebec, is the largest town of the Dominion. It is great in commerce, manufactures and industries. *Toronto,* in Ontario, is a rival of Montreal. It is the most important lake port. *Ottawa,* in Ontario, is the capital of Canada. It is a river port and has considerable timber trade. It is the centre of the greatest water-power of the Dominion. *Vancouver,* in British Columbia, is an important port on the Pacific coast of Canada. It possesses an excellent harbour. Wheat, timber and minerals are the chief exports. *Winnipeg,* in Manitoba, is the seat of the Provincial Government. It is the greatest wheat centre of the world.

Newfoundland

From 1949 Newfoundland has become the tenth province of Canada. It is the oldest colony of England. Geographically it is a continuation of the Eastern Highland regions of Canada. The island itself is nowhere very high. The climate is not attractive, it is rather damp. The damp climate and poor soil of the island retard agriculture.

The population is very scanty, being just over 316,000 most of whom live along the rocky coasts. Much of the island is forested. It is said that *Newfoundland is a forest surrounded by fish.* Fishing is the most important industry, on which the prosperity of the island depends. Nearly one-fifth of the total supply of fish is exported to each of Brazil, Portugal, Italy and Spain. Considerable quantities go to Canada, Greece and the West Indies. Paper manufacture and iron-mining are the two other economic activities. Paper accounts for over 25 per cent. of the exports.

St. John's is the capital and the centre of fishing industry.

The United States of America

The United States of America is the richest country in the world. No other country rivals the U.S.A. in wealth. *Certain conditions combined to help the country to attain commercial greatness.* These conditions are: (*a*) the racial and social inheritance of the people, (*b*) the excellent climate, (*c*) the vast natural resources, and (*d*) a moderately dense population. The original colonists came from Europe, and as such, they brought with them high culture, civilisation and commercial ideas. The climate of the country, generally speaking, is favourable to the activity of mind and body. The natural resources are abundant in minerals, forests, fish and agriculture. The country has a surplus of most essential foodstuffs. She is rich in coal, iron, petroleum, copper, and cotton. ***The great natural resources, on the one hand, and the moderately dense population on the other, have helped the people to maintain a high standard of living, and there is practically no struggle for existence.*** The United States covers more than 5 per cent. of the land surface of the globe. It is slightly less in area than Europe. The location of the U.S.A. is such that it includes the greater portion of the best parts of North America in respect of climate, production and commerce by providing fertile plains in the whole of eastern side, and access to the oceans by the east, west and south. Further, the development of industries in the U.S.A. was aided by its long distance from Europe. The internal rivalries and wars of Europe could not arrest the development of this young country. The U.S.A. for a long time tried to remain aloof from European affairs and adopted a policy of "America for Americans". At present she has given up the policy of isolation and is playing a leading role in the politics of Europe.

The U. S. A. Government always shows a sympathetic attitude towards industries. Mention may be made in this connection of "New Deal" of Roosevelt which aimed at conserving and developing natural resources, encouraging international trade, providing employment for the workers and abolishing child labour and sweated labour.

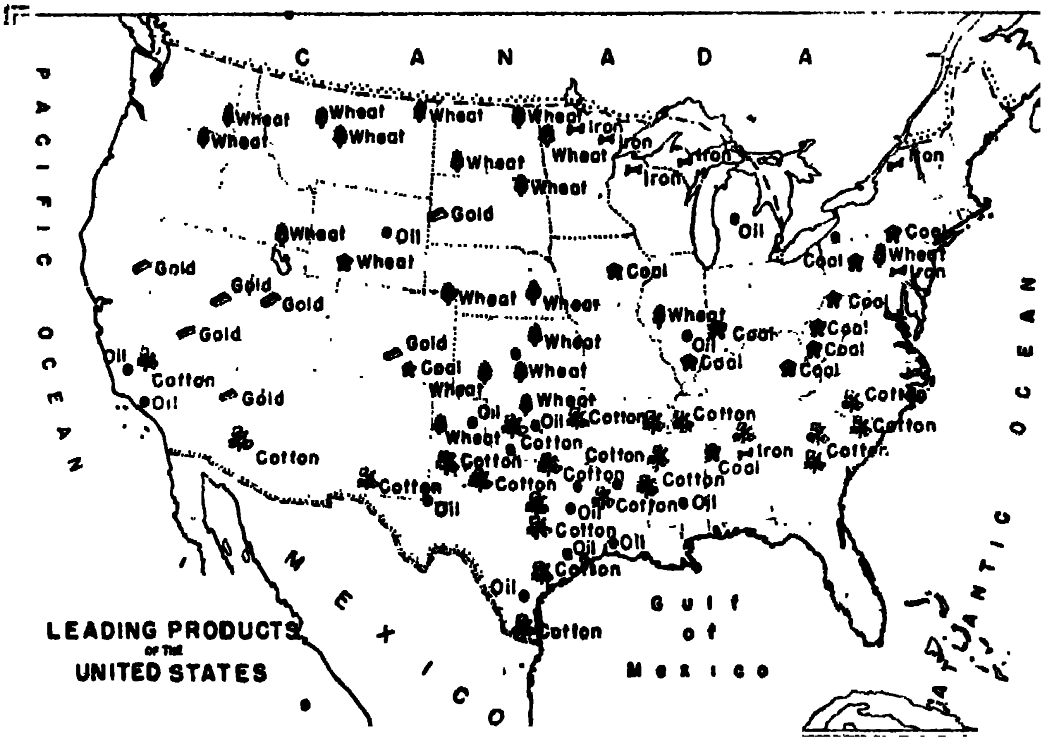

Fig. No. 69. Map showing the chief economic products of the U.S.A. The industrial frontier is fast moving into the Southern States of the U.S.A. mainly because of cheap labour and proximity to agricultural areas.

In spite of there being great progress in various directions, the U. S. A. Government has not yet been able to solve the colour problem. The Negroes, who form about one-tenth of the population in the United States, are treated as though they are members of another and a lower, almost a sub-human, species. Adequate education, just wages and the right to vote are denied to them. Some improvement in the position of the Negroes, however, has been made after the war.

The land area of continental U.S.A. is 2,977,128 square miles. According to 1950 census, the population is 150 millions. The average density of population in 1950 was 44 per square mile. About 13 million are negroes.

The United States is a federation of forty-eight States, each of which is sovereign and equal. In practice, however, the powers of individual States are declining and those of the Federal Government increasing. Most of her needs are supplied by her agricultural land. The country, however, must import rubber, coffee, sugar, banana and vegetable oils. In the case of rubber, recent progress in the production of synthetic rubber has rendered the country greatly independent of the outside world.

The United States is the leading agricultural producer in the world. But in recent years the importance of agriculture has declined considerably. A century ago, 80 per cent. of the people depended on agriculture ; in 1900, it was 37 per cent., and in 1944, it was only 20 per cent. At present only about 10 per cent are engaged in agriculture.

In 1935-39, the composition of agricultural output in U.S.A. was as follows:

	P.C.		P.C.
Meat animals	27	Poultry	12
Grains	13	Milk	22
Cotton	9	Fruit	3
Tobacco	3	Sugar	1
Potatoes	4	Oil crops	2

Wheat is the principal crop of the country. The most productive belt is where there is a light, early summer rainfall and a hot semi-autumn. These conditions are found in Montana, Washington, Idaho, Nebraska, Texas, Oklahama, Kansas, North Dakota and Illinois. The California valley with its Mediterranean climate is also suitable for growing wheat. The production of wheat in 1950 was estimated at 1927 million bushels.* The next important produce is maize. Although the area sown is far larger than the area under wheat, maize is not important for export, as most of it is either used as human food in the south or as fodder for stock of cattle. The maize crop requires rather hot and wet summer ; so the maize belt lies to the south and east of wheat belt. Middle Mississippi valley is very important for this crop ; it is produced in the States of Iowa, Illinois, Indiana, Missouri and Eastern Kansas. The markets are St. Louis, Kansas City and Chicago. In 1950 the production of maize was 3131 million bushels. The next important crop is oats used mostly for the manufacture of breakfast food. Cotton is grown in the south of the maize belt. Eastern Texas, with its rich, black prairie soil is important for the growth of cotton. Texas grows about 25 p.c. of U.S.A. cotton. It is produced also in Arkansas, Alabama, Mississippi, Georgia and Carolina. Cotton production is most heavily concentrated in the lower Mississippi basin extending from about Memphis, Tennessee to Vickburg Georgia and St. Carolina grow "Sea-Island" cotton. *The U. S. A. produces 60 per cent. of the world's supply and Western Europe depends for 80 per cent. of cotton on America.* As a by-product cotton-seed is valuable, which is used either for the manufacture of oil or for cattle food. Recently, cotton cultivation has been introduced in New Mexico, Arizona and California with the help of irrigation. Next comes tobacco. The leading tobacco regions are Kentucky, Virginia, North and South Carolinas and Tennessee. The leading port for shipment is Richmond in Virginia. The U. S. A. produces 40 per cent. of the world's tobacco. In 1949 tobacco output was 1990 million lbs. from 1·6 million acres. The yield per acre is 1224 lbs. The other minor crops are rice and cane-sugar.

In the output of minerals the U. S. A. exceeds all other countries of the world. The chief mineral products are coal (Anthracite ⅙, Bituminous ⅚), petroleum, natural gas, cement, salt, iron ore, silver, gold, copper, zinc, bauxite and lead. The U. S. A. produces more coal than the whole of Western

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* The highest yield was recorded in 1947 with 1,357 million bushels. The production has decreased because of the improvement of agricultural conditions in Europe, Argentina and Australia.

Europe. In 1949, U. S. A. raised 480 million tons of coal. There are five important coal-producing areas in the U.S.A.

(*a*) The most important area is the Appalachians where bituminous coal-fields extend from Pennsylvania to Alabama. This area raises nearly three-quarters of the U. S. A. output of high-grade coal.

(*b*) The second important area is confined to the *eastern interior* and includes Indiana, Kentucky and Illinois.

(*c*) *The western interior* coal-field extends from Iowa through Kansas and Missouri to Oklahama.

(*d*) The Gulf coal-fields extend from Southern Alabama to Texas. This coal is lignite.

(*e*) The S.western coal-fields, are scattered throughout the mountain States. Most of the coal-beds of the regions are in age younger than carboniferous and consist of low grade bituminous and lignite. But these mines are little developed on account of distance from the sea and industrial areas, the mountainous character of the relief and the sparse population. There are no big coal-fields on the Pacific coast.

The next mineral is petroleum. The U. S A. raises more than 60 per cent. of the world's total petroleum output. There are four **oil-bearing areas** :—

(*a*) The most productive region extends from Kansas through Oklahama and north-eastern Texas into Louisiana.

(*b*) The Appalachian belt includes an area from New York State to Kentucky. Its output is decreasing.

(*c*) Ohio, Indiana and Illinois, at one time large producers, do not at present yield much oil.

(*d*) The western belt includes California, Colorado, Montana and Wyoming. California produces as much as Texas does.

The third mineral of importance is copper, which is found in the Rocky mountains. The greatest output is in Arizona, followed by Montana ; New Mexico is also important. In 1949, U. S. A. raised 753,000 short tons of copper. Zinc is produced mostly in Missouri ; other states producing it are Kansas, Oklahama, Montana, New Mexico and Wisconsin. About 600,000 short tons of zinc were raised in 1949.

Gold is found in California, Colorado, Arizona, New Mexico, Utah and Nevada. Silver comes from Arizona, Nevada, Colorado and Utah. About one-fourth of the world's silver and one-ninth of the gold come from the U.S..A. Gold and silver are usually found in close association. Black Hills district in South Dakota is the largest producer of gold in the U. S. A. The mines of the district were discovered in 1876. California, also known as "Golden State", has large deposits of gold on the western slope of the Sierra Nevada mountains.* Iron is obtained from Minnesota, Wisconsin and Michigan and is worked chiefly in *Chicago, Buffalo* and *Pittsburg*. In 1949, U. S. A. had a production of 84 million short tons of iron ore.

The U. S. A. is the leading supplier of aluminium in the world. The ores are usually found in the south of the Appalachian mountains. As a supplier of non-ferrous metals like copper, lead, zinc, silver, gold and aluminium, the U. S. A. occupies a dominant position. She supplies about half of the world's copper, half of the lead, half of the zinc, one-fourth of the silver, and nearly one-fourth of the aluminium. In recent years she has also been the world's largest producer of each of these metals with the exception of gold, in spite of the fact that she suffers from certain very definite disadvantages. Her labour is dear, her producing areas lie far inland—away from her industrial areas, and her transport costs are high. The U. S. A. is deficient in domestic supplies of manganese, tin, aluminium, mica and chromium. Although the U. S. A. has large deposits of molybdenum, it lacks many other alloys like nickel, tungsten and antimony. Small deposits are scattered throughout the States, but only a very few are of economic importance, and even these require protection by import tariff to keep them open. The important manganese fields are in Montana.

The most recent feature in the mining industry of the U. S. A. is the constant decline in the output of metallic ores due to increased consumption during the last two years. Copper resources are estimated to last 10 years more, and the country is already importing to meet 50 per cent of copper requirements. Imports now meet about 30 per cent. of internal requirements in antimony, asbestos, mica, manganese and tungsten. About

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* Since gold was first discovered in California in 1848, about $2,000 million worth of this metal has been mined. In 1950 the output of gold was 2·1 million troy ounces.

50 per cent. of bauxite for aluminium must be imported. Chromite, platinum, nickel and tin are to be wholly imported.

Hydro-electricity plays a very important part in the industries of some areas in the U. S. A. Towns on the *"Fall line"* use water-power to drive their machinery.* The aluminium manufacture in Massina (New England State) and flour-milling in Minneapolis are dependent on water-power.

Water-power regions in the United States:

(*a*) The northern and north-eastern parts of the United States, from Maine to Minnesota. (*b*) The Appalachians from Pennsylvania southward to Alabama. (*c*) The Tennessee River Basin has become a major, highly developed, water-power region. The TVA is a Multiple-purpose federal agency which carries out its duties in an area embracing some 41,000 square miles in the Tennessee River Valley states: Tennessee, Kentucky, Mississippi, Alabama, North Carolina, Georgia and Virginia. Under the Act (1933) its chief duties are flood control of a difficult river and the maintenance of navigation. There are now 27 major dams and reservoirs controlling the flow of the river ; in addition the headwaters and the shores of the reservoirs are being re-forested. There is now a navigable channel 630 miles long, connecting with the American system of inland waterways. This has helped the production and distribution of hydro-electric power which has multiplied from 1,500 million kwh. in 1933 to 17,514 million in 1950.

The United States is the strongest country in the industrial world. About one-fourth of the gainfully occupied population of the U.S.A. is engaged in manufacturing. *The foremost industry of the U.S.A. is iron and steel production, and the States which are highly developed in this direction are Western Pennsylvania and Eastern Ohio.* This is due to the fact that there are vast coal-fields in this area ; moreover, there is a good market for the manufactured goods, and iron ore required is brought from the *Lake Superior District* by cheap means of transport. The ore from this place goes to the lake ports, from where it is carried by railways to the manufacturing centres, such as *Pittsburg* and *Chicago.* The second area of importance is *Alabama* which, in spite of having local supplies of coal, iron ore and lime-stone, suffers from a handicap of being situated at a considerable distance from markets and ports. The region produces the cheapest steel in the world and the chief centre is Birmingham.

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* Rivers flowing through the South Appalachian region descend by falls over the Piedmont plateau. The *fall line* so formed plays a big part.

OUTPUT OF IRON AND STEEL IN U.S.A.
1949

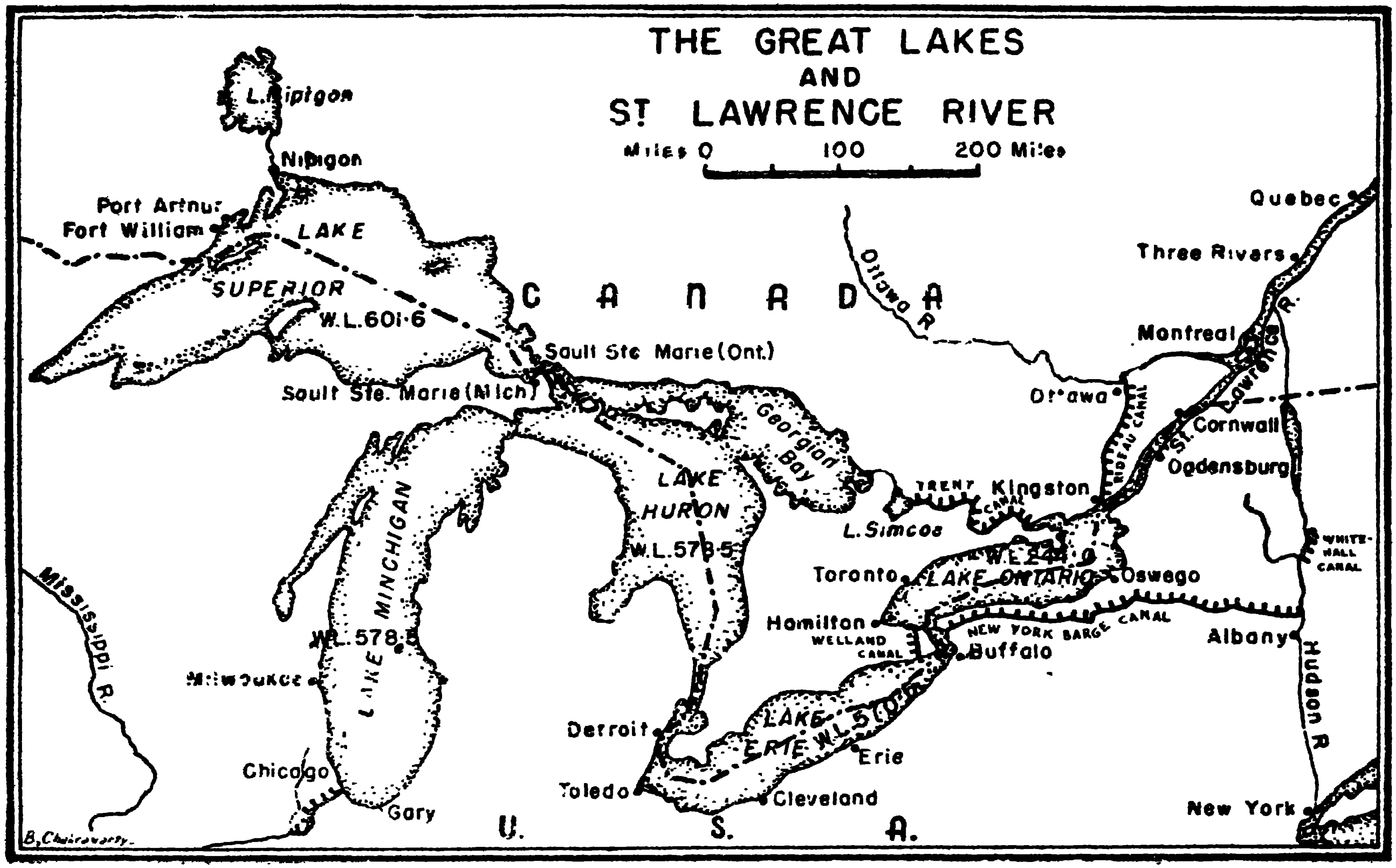
(In million tons)

Pig Iron	54·9	Structural Shape	4
Steel and Ingots	77·9	Bars and Concrete	1·3
Rails	2·0		
Plates and Sheets	17·2	Skelp and Strip	5
Wire rods	4	Others	12

Specialisation is the feature of the iron and steel production in the U.S.A. In the agricultural districts, agricultural machinery is produced and *Chicago* is the chief centre for the Middle West. Another centre of equal importance for the manufacture of agricultural machinery is *Milwaukee.* In the textile districts of New England there is a great demand for machinery and *Worcester* is the chief centre of textile machinery. *New York,* where there is a great demand for electrical machinery on account of water-power, produces electrical engines and machinery. The great railway centres of the U.S.A., such as Philadelphia, Chicago, Pittsburg, St. Louis, produce locomotives and have large railway workshops. Shipbuilding is carried on in the ports on the Atlantic, the South Pacific and the Lake districts. *Detroit* is the greatest centre in the world for automobile industry. In the fruit-growing districts, tin plates are made for the canning industry.

In the production of manufactures like industrial machines, locomotives, electrical machinery, automobiles, aircraft, tractors and machine tools, the U.S.A. can undersell other countries in spite of her high wages prevailing in the country.

The second important industry in the U.S.A. is the textile industry, in which the cotton manufactures take the lead. The first home of cotton industry lay in the New England States. (These States have 1 moist climate, 2 plentiful supply of water-power, 3 cheap cotton from the south, 4 cheap coal from Pennsyl-


THE GREAT LAKES
AND
ST LAWRENCE RIVER
Miles 0 100 200 Miles
L. Nipigon
Nipigon
Port Arthur
Fort William
LAKE SUPERIOR
W.L.601·6
CANADA
Sault Ste Marie (Ont.)
Sault Ste. Marie (Mich)
Ottawa R
Ottawa
RIDEAU CANAL
Quebec
Three Rivers
Montreal
St. Lawrence R.
Cornwall
Ogdensburg
Georgian Bay
LAKE HURON
W.L.578·5
TRENT CANAL
Kingston
L. Simcoe
W.L.244·0
Toronto
LAKE ONTARIO
Oswego
WHITE-HALL CANAL
Hamilton
WELLAND CANAL
NEW YORK BARGE CANAL
Buffalo
Albany
Hudson R
LAKE MINCHIGAN
W.L.578·5
Milwaukee
Chicago
Gary
Mississippi R.
Detroit
Toledo
LAKE ERIE W.L.5
Erie
Cleveland
New York
U. S. A.
B. Chakravarty

FIG, NO, 70.

vania and easy access to interior markets. There is also a large centre at Philadelphia. In the Southern States of Alabama, Georgia and Carolinas, the industry is of recent growth and produces coarse cloth for China and Canada markets.

Woollen industry has made rapid advance in the North-East with Philadelphia as the centre. Wool is imported from Australia and Argentina to Boston, the greatest wool market, from where it is distributed to the New England States. America is noted for the manufacture of silk which is chiefly carried on in New York, New Jersey and Pennsylvania. In textile goods, the U.S.A. finds it extremely difficult to meet competition in the world market from Japan, China and India. The textile industry employs about 1·1 million workers.

Pulp and paper manufactures are important in the New England States on account of timber and water-power. The greatest centre of flour mills in *Minneapolis*. The other industries carried on are sugar-refining, meat-canning (in the States of Maine and New York), fruit-canning (in California) and fish-canning (at Baltimore). In recent years the U.S.A. has made great progress in synthetic rubber production. More than 400,000 tons of synthetic rubber are being produced annually.

The growth and development of the transport system of the U.S.A. are remarkable. Of all the countries in the world, the U.S.A. has the largest mileage with its surface covered with a network of railways linking up the interior with the coasts and uniting the distant east and west and north and south. The U.S.A. possessed about 237,798 miles of railroads in 1949. The mileage comprises somewhat more than 45 per cent. of the world's total. There are three regional groups of railways. The Northern Group serves the north-eastern States and handles about 45 per cent. of the traffic. The Southern Group, with 20 per cent. of mileage, deals with some 18 per cent. of the traffic ; the Western Group, with almost 55 per cent. of the mileage, handles 35 per cent. of the traffic. The trans-continental routes from the west to the east are of great importance. They carry the products of the Pacific States and of the central plain to the industrial east. From New York one line (the Northern Pacific Railway) goes to Chicago along the Mohawk Gap through Buffalo. From Chicago the line proceeds to Seattle on the Pacific coast *via* Milwaukee and

St. Paul. Another line (the Union Pacific Railway) from Chicago, after crossing the Rockies, proceeds towards San Francisco and thence to Los Angeles. New Orleans is an important centre of trans-continental route. A railway line (The Southern Pacific Railway) starts from New Orleans and continues to Los Angeles. The ordinary gauge of the railway line in the U.S.A. is 4 ft. 8½ inches.

Of the two big natural means of inland transport, *viz.*, the Great Lakes and the Mississippi-Missouri system, the first—the Great Lakes—though of great importance for the eastward and westward movement of grain and iron ore and of coal and manufactured goods respectively, suffers from a handicap due to its situation at different levels necessitating the construction of canals and locks which limits the size of vessels for through-journey. Of the canals, thus constructed, the Soo Canals carry more traffic than the Panama and the Suez Canals combined. Rapids between the Lake Superior and the Lake Huron made it necessary to construct the Sanlt Ste Marie or Soo Canals. The enormous value of the Great Lakes system is, however, mainly due to its location in the very centre of the temperate zone and to its natural and artificial outlets facing eastwards towards Europe across the busy North Atlantic.

The Mississippi-Missouri system, providing navigation as far inland as the great Falls in the State of Montana, has not been so useful as it seemed at first. Navigation is greatly hindered by ever-shifting mud bank, necessitating the construction of the famous "stern wheel" boats. The river not only meanders in its lower course over its flood plain but it flows also in a north-south direction into the out-of-the-way Gulf of Mexico. Thus the Mississippi is still mainly used for very slow local traffic notwithstanding the difficulties overcome by the opening of the Panama Canal.

The U.S.A. handles a large volume of air-traffic, larger than the total of all other countries. The efficient system of beacons, direction-beams and well-equipped air-ports have helped the working of aerial navigation. The lines are linked with those of Canada and South America, and there are also trans-Atlantic and trans-Pacific services.

The class of goods imported by the U.S.A. is mostly raw materials for luxury articles. Japan exports silk and tea ; India, jute, hides and tea ; Malaya Peninsula, rubber and tin ; Philippines, sugar and hemp ; China, beans and silk ; Australia, wool ; Canada, paper and nickel. Raw cotton, petroleum and tobacco figure largely in the export trade of the U.S.A. The other exports are iron and steel goods, machinery, motor cars and aircraft.

The trade between the U.S.A. and Europe is mostly one-sided. Europe imports cotton, grains, oil, meat-products and tobacco. The only export from Europe is luxury goods.

TRADE CENTRES AND PORTS

New York is the second city and the third port in the world. Its importance is due to a combination of factors, such as its natural harbour, its nearness to Europe, its easy access from inland cities, and its situation in the midst of the area producing either raw materials or manufactures. *Baltimore*, an important port, stands on the northern bank of the river Patapsco, an arm of Chesapeake Bay, 90 miles south-west of Philadelphia. It is an important centre of traffic in bread-stuffs which are largely received by rail and shipped at this point. Other leading articles of export are tobacco, livestock, cotton, timber and oyster. It is also the seat of extensive and varied manufactures including cotton and woollen goods, tobacco and cigars, iron and steel etc. One of the principal industries of Baltimore is the canning of oysters. *Chicago* has got a natural advantage of communication. It is situated in the area which produces a large quantity of grain and livestock ; it is at the

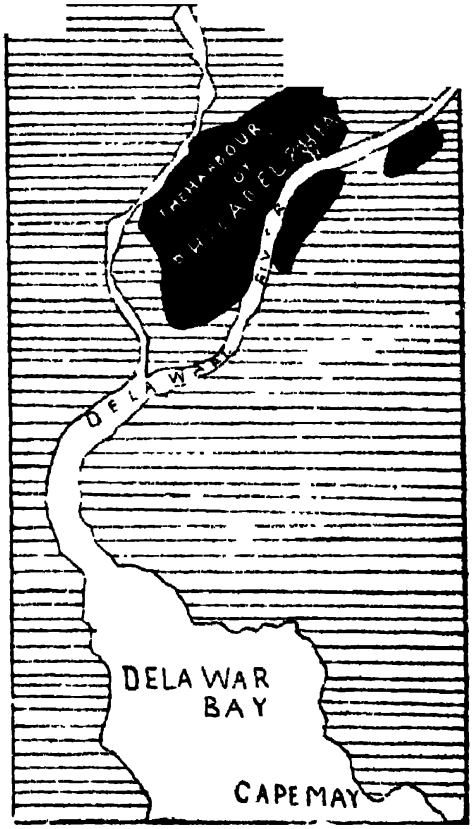


FIG. No. 71. Map showing the location of Philadelphia.

head of the lake navigation. Chicago is the greatest railway centre as well. *Philadelphia* has a fine natural harbour.. Its nearness to the regions of coal and raw materials makes it an important industrial centre for woollen and industrial goods. *St. Louis* is situated in the prairies between the lakes and the Gulf of Mexico. It is surrounded by grain, cattle, cotton and tobacco regions. It is a great railway centre and a manufacturing town. *Pittsburg* is the largest iron centre in the world on account of its nearness to coal, iron ore and limestone. Moreover, it is situated at the junction of navigable rivers. It has also got some special advantages for glass-making industry on account of the presence of natural gas. *Boston* is an important Atlantic port. It is also the receiving and distributing centre of the north-eastern industrial States. *Galveston* is situated at the mouth of the Galveston Bay and is the natural outlet for the bulk of the trade of the south-western States. It is the greatest cotton-shipping port in the world, and its total trade places it second to New York only in the U.S.A. *San Francisco* is the only natural harbour on the Pacific coast and is the sole outlet for the products of the Californian valley. The opening of the Panama Canal has made it important. *Kansas* is a livestock market and is situated between maize and cotton areas. It has important industries, such as meat and tanning. *New Orleans* is the greatest cotton and wheat-exporting centre in the world.

Mexico

The geographical situation of Mexico is highly favourable to commerce, as it faces both the Atlantic and the Pacific Oceans, and is a neighbour to the U.S.A.—the greatest industrial country in the world. The country would have been great in commerce and manufacture, were it not for political and social conditions. For long the Government was weak ; revolutions and banditry were frequent.

The total area of Mexico is 763,944 square miles, and the population in 1947 was 22·7 million.

About one half of the land lies in the temperate zone and the other in the torrid zone. The climate, therefore, varies from tropical to temperate from south to north. The variety of climate gives rise to a variety of vegetation. Mexico is capable of producing almost every variety of vegetable product. But only about 10 per cent. of the land is well suited to agriculture. Much of the land is poorly managed and badly cultivated. If modern methods are adopted, Mexico may produce many times its present volume of crops. Maize and coffee are the chief crops. Sisal hemp is also cultivated extensively in the grass-lands of the north.

Rainfall occurs in summer, but the quantity is not sufficient for agriculture. Therefore, it has been necessary to develop irrigation works.

Mexico is a store-house of minerals—petroleum, silver, lead, zinc, gold and others. The Western Range is volcanic and this partly accounts for its wealth of minerals. Mexico is the leading producer of silver in the world, a producer of petroleum and an important producer of copper and lead. In the past it was one of the great sources of gold. Mineral products constitute about 80 per cent of the exports of the country. The manufacturing industries are carried on to supply the home market. Cotton, sugar, cigar and cigarette are manufactured in great quantities for export. Because of the mountainous nature of the relief, transportation is expensive. Good roads are almost unknown except in a few larger cities. The Gulf Coast of Mexico has no first class harbour ; the harbours on the Pacific side are, however, better, but as yet their commerce is small.

Mexico is the capital and is an industrial centre for the production of leather and leather goods. *Tampico* and *Vera Cruz* are the two ports.

QUESTIONS

1. Discuss the position of Canada as :
    (*a*) an agricultural country;
    (*b*) a producer of minerals.
2. Explain why the wheat belt is moving towards the west in Canada.
3. Describe the principal agricultural regions of the U.S.A.
4. "Though young in the industrial field, U.S.A. has made rapid progress in the matter of industrial development." Give your reasons as to how it has been possible for it to make such progress.

(Cal. Inter. 1936).

5. Discuss the geographical factors that have influenced the distribution of wheat, maize, cotton and tobacco in North America. Discuss also the trade in cotton or wheat. (Cal. B. Com. 1929).

6. Examine the influence of geographical factors on the localisation of the iron and steel industry in U.S.A. (Cal. B. Com. 1931).

7. Describe the mineral resources of Mexico and discuss the chances of their full development. What do you know of the attempt in the country to check foreign exploitation of these resources? (Cal. B. Com. 1928).

8. Carefully describe the position of the chief coal and iron districts of North America, paying special attention to the means of communication for bulky trade. (Cal. B. Com. 1924).

9. Locate the chief industrial and mineral regions of North America and show how they are linked up. (Cal. Inter. 1938).

10. Examine and estimate the coal and petroleum resources of U.S.A. (Cal. Inter. 1931).

11. What are the chief mineral products of the United States of America and where they are obtained? (Cal. Inter. 1940).

12. Name the commodities of which the U.S.A. is the largest supplier in the world's markets. What other parts of the world are also important producers of these commodities? (Cal. B. Com. 1940).

13. Describe the recent development in transport facilities that have given impetus to agricultural production in Canada. (Cal. B. Com. 1930).

14. Indicate carefully the coal resources of the U.S.A. How have they helped the development of the industries of the country? (Cal. Inter. 1944).

15. Compare the relative advantages which Great Britain and U.S.A. have for the development of steel industry. (Cal. B. Com. 1947).

16. Comment on the situation of the chief coal-fields and the chief manufacturing areas of the United States. (Cal. Inter. 1949; 1951).

17. What are the principal manufacturing industries of the U.S.A.? Describe the areas where these industries are carried on. (Delhi Univ. B.A. Hons. 1950).

18. There is every indication that the industrial frontier is moving into the Southern States of the U.S.A. What do you think are the causes of this shift? (Delhi Univ. B.A. Hons. 1951).

19. Describe fully the iron ore resources of North America and their present exploitation. (Cal. B.A. Hons. 1951).

CHAPTER XII

SOUTH AMERICA

South America is somewhat smaller than North America and occupies the fourth place as regards size among the continents. In proportion to its area, South America has a shorter coast-line than any other continent except Africa. The coast is singularly devoid of indentation. Only in the south-west, it is somewhat broken. The west coast is steep and high with only one opening, the Gulf of Guayaquil. The east coast is everywhere low and shelving.

South America may be divided into six natural regions—three highlands and three lowlands. The former are: (*a*) the Andes, (*b*) the highlands of Brazil, and (*c*) the highlands of Guiana. The lowlands are the basins of: (*a*) the Orinoco, (*b*) the Amazon, and (*c*) the Parana Paraguay.

The important rivers are the Amazon, the Orinoco, the Plata and the Colorado. The Amazon is 4,000 miles long, and is the greatest river in the world. Its slope is extremely gentle. It is navigable by large ships up to 1,000 miles from the mouth, and by small boats up to the foot of the Andes. The Amazon with its tributaries provides 50,000 miles of navigation. The inner basin of the Amazon is the World's largest forest area covering as it does 1·4 million square miles. The whole of Western Brazil is covered by the Amazon watershed. As a waterway, the Amazon is not very important because of the paucity of population in the region through which it passes and also because of the limited products of similar types throughout the region. The Orinoco in the north is navigable for more than a thousand miles. The Parana system is very important in the continent from the point of view of commerce. It flows through the heart of Argentina, Paraguay and Southern Brazil. The Parana and the Uruguay waters drain half the continent and join as the Rio de La Plata river. The *Rio de La Plata* is both an estuary and a river as it fulfils some of the conditions of each. According to international law it is a river and is 137 miles wide. Much silt has been deposited on the Plata by the Parana and the Uruguay;

often ships run aground until the next tide floats them again. Tides usually make a difference of about 3 feet. Winds, however, influence the level much more; strong winds, particularly

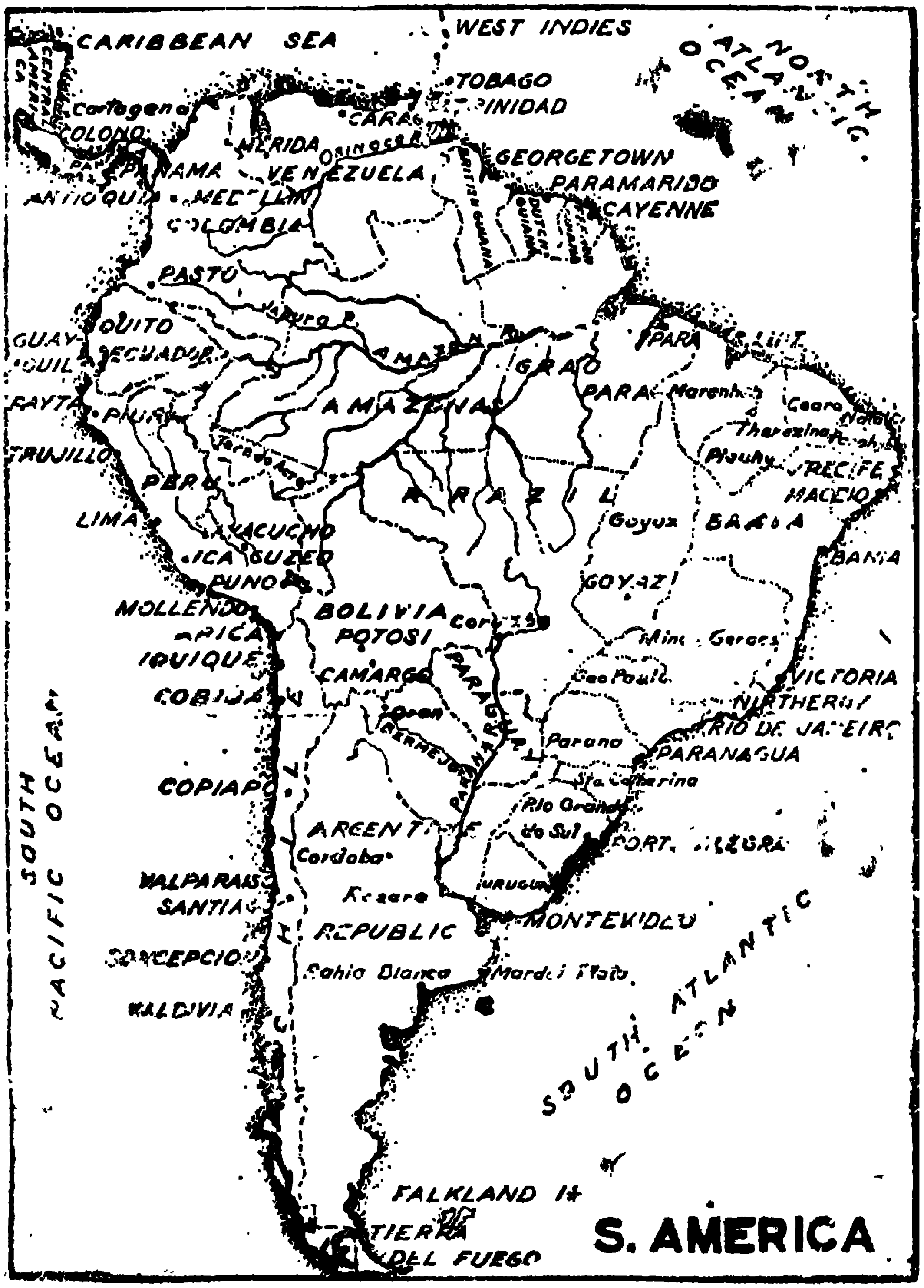


FIG. No. 72. Map showing the political divisions of South America. Note the absence of ports in the southern peninsula.

the Pampero blowing from the south-west, can raise or lower the level double that amount.

Nearly four-fifths of South America fall within tropics and, therefore, the greater part of the continent has a tropical climate. The temperate belt lies to the south beyond 30° latitude. Continental climate is absent. The population is still very scanty, being a little over 65 million.

THE HINDRANCES THAT HAVE CHECKED THE DEVELOPMENT OF SOUTH AMERICA

I. Race is a dominant issue in South America. The majority of the white people at first came as soldiers and adventurers. They came not to settle in South America but to plunder the continent. In every State they inter-bred with the Indians. To-day, three-fourths of the population consist of Indians, Negroes and Mestizos (mixture of white and native). The whites are prominent only in Chile, Argentina and Uruguay.

II. Bad climate and the prevalence of deadly fever make the people inert, passive and idle. The death rate is also very high. Fortunately it is possible now to conquer tropical diseases with medicine, and South America is receiving the benefits of the results of scientific progress.

III. The *national differences* are also responsible for the political and economic backwardness of the continent. The terms "savages", "niggers" and "barbarous" are often used by the people of one Republic against those of the other. To this must be added the weakness of Government institutions. Instability of Government is one of the worst handicaps to the development of a country in the modern world, where progress and prosperity depend essentially upon credit. In all the Republics of South America political disturbances are frequent, property is insecure, internal accumulation of capital is hindered, and foreign investors generally feel shy to invest money in industries.

IV. The difficulties of communications: Roads are generally poor and the railways have not developed to a great extent except in a few Republics.

V. The shortage of coal: Rich in almost every other mineral, South America is poorly provided with coal deposits.

There are only a few areas of coal-bearing rocks because the Highlands of the east and north-east are of *pre-Paleozoi rocks* and the sediments are very young. However, small deposits of good quality coal are found in Peru and Chile. The poverty

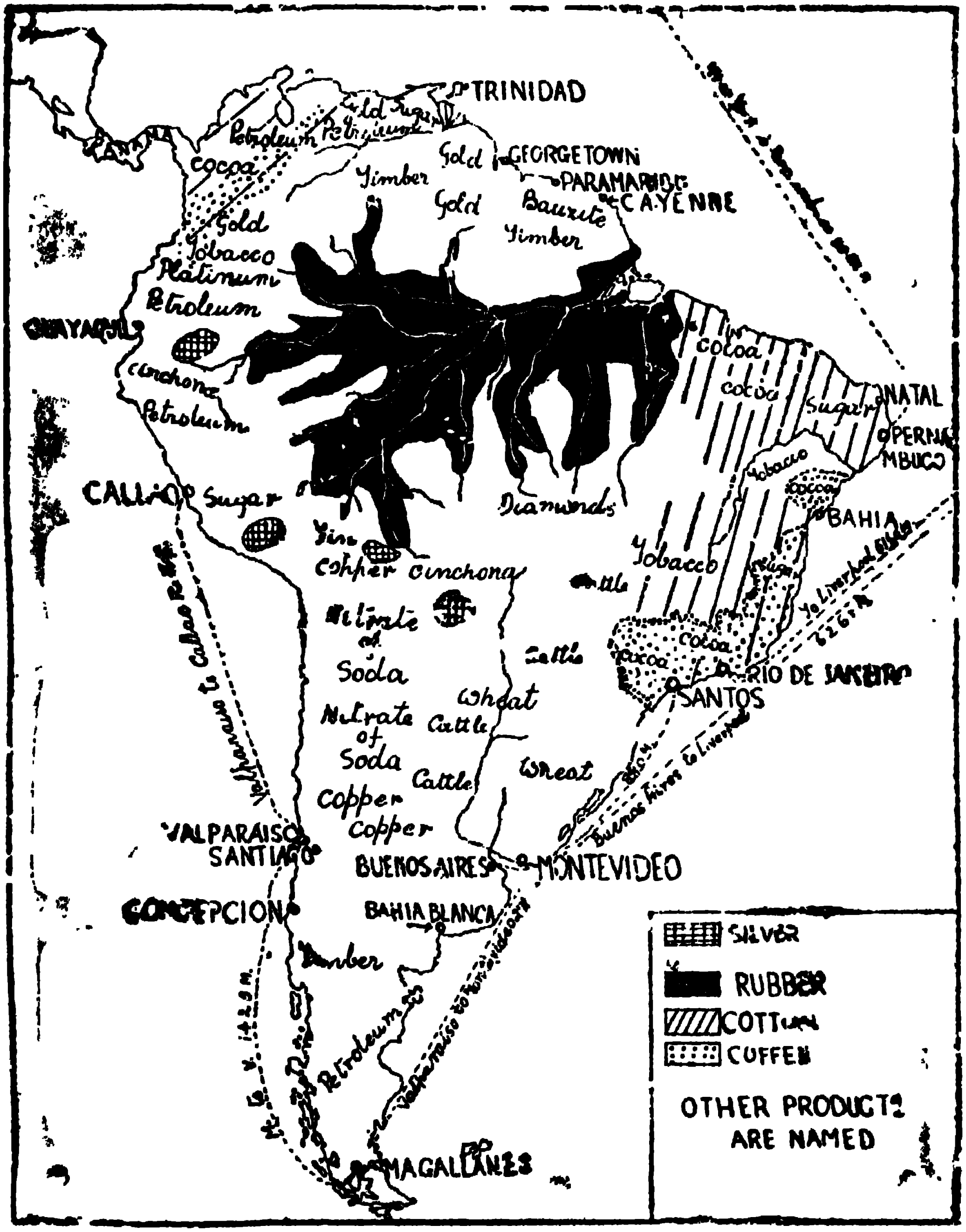


FIG. No. 73. Map showing the economic products of South America.

of South America in coal compelled the continent to devote its attention to the production of raw materials and agricultural and pastoral produce. But the discovery of petroleum in Peru, Venezuela, Argentina, Ecuador and Columbia has brought a new industrial life in the continent. Hydro-electric power can also be developed to a great extent as the continent is full of rivers and waterfalls. Paucity of labour and high wages are the present obstacles.

VI. South America is a producer of raw materials. Most States are one-crop or one-product countries, and they live on exports. South American trade depends on Europe which takes more than 60 per cent of the continent's exports. Therefore, whenever the European demand for South American goods falls as a result of war or blockade, the consequence is disastrous.

There are 12 political divisions in South America.

1. Panama.
2. Columbia.
3. Ecuador.
4. Venezuela.
5. Colonial Guiana:
   (a) French.
   (b) British.
   (c) Dutch.
6. Brazil.
7. Peru.
8. Bolivia.
9. Chile.
10. Argentina.
11. Paraguay.
12. Uruguay.

All these countries, with the exception of Colonial Guiana, are politically *"democratic"*.

Columbia occupies the fifth place among the States of South America in respect of size. It has an area of 440,000 square miles with 11 million population. The bulk of the population lives at altitudes from 4,000 to 9,000 feet above sea level. Columbia is situated in the middle of the Torrid zone where the temperature is very variable according to altitude. The average in the coastal zone and in the low valleys is 86°F; it drops to 77°F in the Cauca valley, to 68°F in the Gogota Savanah (9000 ft.). Rainfall also shows great variation: it is particularly intense on the Pacific coast, where it normally exceeds 400 inches annually. In plains it does not exceed an average of 200 inches. The country occupies a favourable geographical position facing the Atlantic and the Pacific oceans. Although the soil is fertile in Columbia, the agriculture is not very important. Mild coffee, rice, banana, rubber, fibre and sugar cane are grown for domestic consumption. Far behind

Brazil, Columbia comes second in the world production of coffee. In the production of *mild coffee,* Columbia ranks first. Coffee cultivation is mainly carried out on the slopes of the Cordillera of the Andes. The Cordillera comprises vast areas of fertile and deep soil of volcanic origin, excellent for coffee cultivation. The banana plant is the most commonly used temporary shade. Permanent shade is provided by various species of trees. Transportation from the producing areas to the commercial centres and ports is a big problem in connection with coffee. Other crops are rice, sugar-cane, maize and wheat. Rubber trees grow wild, and its cultivation has begun. Animals are often used to carry coffee. Livestock includes cattle, pigs, horses, sheep, goats and mules. The mineral wealth of the State is very great. Gold and silver are found in considerable quantities. The output of gold in 1950 was 406,000 fine ounces. Silver production in 1949 was 107,000 fine ounces. Iron, coal and platinum also are obtained. In various parts of Columbia petroleum is found and the rapid increase in its output has made Columbia the second oil-producing country in South America. Petroleum production in 1950 was 34 million barrels.

The means of communication are exceedingly bad. Roads are absent and the railway mileage meagre. Climatic conditions, coupled with the obstacles to communications between different parts of the land, have retarded the economic development of the country. In civil aviation, however, Columbia ranks first among the South American countries. The capital is *Bogota* situated at a height of 8,000 ft. above sea level and enjoys a healthy climate.

Venezuela. The Republic of Venezuela, though an agricultural country, is fairly rich. Venezuela has an area of 350,000 square miles with 3·5 million population. There are three distinct zones of production—the agricultural, the pastoral and the forest zones. The agricultural region, situated in the northern part of the country includes vast fertile lands. It has an area of 116,000 square miles, of which only 1 million acres are cultivated. The agricultural products are wheat, rice, tobacco, maize, coffee, sugar cane, cotton and beans. One-fifth of the population is engaged in agriculture. The livestock includes 4 million oxen, 1 million goats, 100,000 sheep, 400,000 horses and mules and 360,000 pigs. Among mineral products gold, copper, petroleum, coal and iron are important. In recent years Venezuela has become the second largest oil-producing country in the world furnishing 9 per cent of the total. It is the largest petroleum exporting country in the world. In 1950 production of oil was 546 million barrels of which 423 million barrels were exported. The important towns are *Caracas* (capital) and *Valencia,* and the ports are *La Guaira* and *Porto Cabello.*

Ecuador is one of the smallest and poorest South American States. Ecuador is situated in the north-west of South America, with about one-fifth of its area lying north of the Equator. It embraces nearly 280,000 square miles with 4 million people. The whites form only 8 per cent of the population. The average density of population per square mile is 12. The land cultivated is of alluvial origin with vast zones of volcanic origin. Climatic conditions in Ecuador, determined by its location, are influenced also by the mountainous nature of the country and the antarctic current which penetrates at Guayaquil. The main crop is cocoa, on which the greater part of the country's prosperity depends. Next in importance are rice, ivory-nuts and coffee. Coffee is cultivated on a large scale in conjunction with the cocoa plant and the banana, which serve as shelter for the coffee plants. There are several suitable coffee zones most of which are confined to the west, especially in the province of *Manabi.* The State has considerable mineral wealth, but so far mining operations have not developed much. Oil-deposits are important. In 1949, the oil output was 2·5 million barrels. The country has deposits of gold, silver, copper, iron, lead and coal. Ecuador is the chief producer of "Panama" hats. In 1947, Ecuador exported 3 million hats. The capital *Quito* is situated at an elevation of 9,000 ft. *Guayaquil is the chief sea port.* It normally handles about one-half of the total exports. The other ports are Manta and Bahia de Caraquez.

Bolivia. The economic development of Bolivia is slow and small. The population is only 3,000,000. Lack of labour is proving a great handicap to the development of industry. The means of communication are bad, and the State has no port of its own. Agriculture, stock-raising and mining are the chief industries. Tin, copper, silver and gold are the principal mineral products. Bolivia contributes more than 20 per cent. of the world's total production of tin. Sheep, Alpacas and Llamas are reared extensively. The chief agricultural products are coffee, cocoa, rice, sugar and tobacco. About 90 per cent of the people are Indians. The political power is concentrated in the hands of the tin merchants. *La Paz* is a commercial centre and the seat of the government. The constitutional capital is *Sucre.*

Chile. The Republic of Chile is one of the most progressive States of South America. The area of the country is 286,000 square miles. The coastline is about 2,500 miles in length ; the average width of the country is 110 miles only. The density of population is 20 per square mile. The population is about 5,000,000 (1940). The Republic ranks seventh in size among the States of the continent.

Desert conditions prevail in the northern side of Chile. Nevertheless it is a centre of great industrial activity. Great deposits of nitrate of soda are found, the export of which provides one of the chief sources of Chilean revenue. The Republic alone supplies practically all the world's requirements of natural nitrate of soda which is used as a fertiliser, in chemicals and explosives. Recently the introduction of synthetic nitrates has greatly affected the Chilean nitrate industry. Copper, gold and silver are also obtained from Northern Chile. Copper is the most valuable export and about 15 per cent of the world's production is obtained from the Republic. Chile's copper reserves are 37 per cent. of the world's reserves.

Central Chile is very important from the agricultural point of view. Here the Mediterranean type of climate prevails. It is the most highly developed and most densely populated region. All the agricultural products are sent to Northern Chile to meet the demand of the large mining population there. Both water-power and coal are abundant. The manufacture of wine is also an important national industry and the Chilean wines are much in demand both at home and in the neighbouring States ; some are also exported to Central Europe. Southern Chile provides suitable grazing ground for cattle and sheep. The forest resources have been little exploited. The chief town is *Santiago.* The two important ports are *Valparaiso* and *Iquique.*

Brazil occupies nearly half the area of the continent and rivals the U. S. A. in respect of size. The area of Brazil is 3·3 million square miles with 49·8 million population (1949). The average density of population is 16 per square mile. The highest density of population is in the *Sao Paulo* where it is 80 persons per square mile. The language of the country is mainly Portuguese. Though it has a long coast-line of more than 4,000 miles, the country is singularly devoid of good harbours. The north coast is low and swampy and in the south it is bordered by a sandstone reef. The country has a large number of rivers, the longest of which is the Amazon, nearly 4,000 miles. The tropical type of climate prevails in three-quarters of the Republic ; the remaining portion has temperate climate modified by altitude. The country is so vast in area and its economic possibilities are so great that it is sometimes described as a *sleeping giant.** The lack of communication, inadequacy of capital, paucity of labour and unhealthy climatic conditions in the north are the present obstacles.

Agriculture is the most important industry. The products are coffee, cocoa, rubber, sugar, tobacco and cotton. Brazil supplies more than 80 per cent. of the world's coffee. Much of the prosperity of the country depends solely on this particular commodity. Coffee is grown in nearly all the States of Brazil. The favourable zone is a vast tract of land which from north to south extends from the banks of the Amazon to the State of S. Catherina, and from east to west, from the Atlantic coast to the western extremity of the State of Matto Grosso. This extraodinarily wide stretch of land, is nevertheless devoted only to a small extent to coffee. *Cultivation is confined to Sao Paulo, Minas Geraes, Espirit Santo, Rio de Janeiro, Parana, Bahia and Pernambuco which supply between themselves 98 per cent. of the country's production. Sao Paulo alone produces two-thirds of the total.*† As a matter of fact, Sao Paulo is the main coffee-producing centre not only in Brazil, but also in the whole world. There are many reasons for its success in this region. In the interior of Sao Paulo, there is a plateau, with an average altitude of about 1800 feet stretching from the western slopes of the maritime chain to the river Parana and sloping gently from east to west. The soil of the place is rich in iron, a mineral that the coffee plant requires to be well supplied with. The climate is also well suited to Europeans and is sufficiently invigorating to encourage bodily activities. Thus the interior plateau of Sao Paulo offers optimum conditions for coffee plants. The production of coffee in Brazil for 1949 was 18 million bags of 132 lbs. each. The highest production was in 1933-34 when Brazil produced 30 million bags. The sales of coffee are controlled by the Government. Since 1940 the surplus coffee has been converted into raw material for plastics. In 1950, about 15 million bags of coffee were exported.

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* The Government of Brazil have approved a five-year development plan known as the Salte Plan, to be completed by 1954. The aim of the plan is to raise the standard of health in the country, expand agricultural production, increase the supply of electrical power and fuel and improve the transportation system in the country.

† International Institute of Agriculture, *"The World's Coffee"*, Bureau of F.A.O. Rome, 1947, p. 193.

Brazil ranks second in the production of cocoa which is extensively grown in Bahia. Two-thirds of Brazilian cocoa go to the U. S. A. Sugar and tobacco in which Brazil occupies the third place among the producers are becoming increasingly important. With regard to maize, Brazil is the fourth among the producing countries of the world, being excelled only by the U. S. A., Rumania and Argentina. In recent years the cultivation of cotton has also advanced rapidly. The fibre is short but it is of good quality. Rubber is found in the Acre territory and the States of Amazonas and Para. Its production was greatly encouraged during the Second World War. In 1949 the production of rubber was 28,000 tons against 18,000 tons in 1940.

Next to agriculture, the pastoral industry is important. Pigs, sheep, horses and cattle are extensively reared. The country is one of the most important pig-rearing countries of the world.

LIVESTOCK CENSUS FOR 1949

(In million)

Cattle	46·2	Goat	8·0
Pigs	24·5	Horses	6·7
Sheep	18·9	Oxen	11·8

Though mineral resources are great, they are not worked very much on a commercial scale. The principal minerals are chrome ore, mica, zirconium, graphite, manganese, coal, iron, gold, salt, diamond and beryllium. Brazil is the third largest manganese producer. The local consumption is small, and practically the entire production is exported outside. The chief mines are in the State of Minas Geraes. There has been also a small production of manganese near Nazareth, Bahia State. Coal is found in *Rio Grande de Sul, Santa Catharina, Parana and Sao Paulo*. The output of coal in 1942 was about one million tons. Iron deposits exist chiefly in Minas Geraes. The Government has recently opened up a new iron field at *Itabira* which is believed to be one of the richest iron fields in the world. Gold is widely distributed, but it is chiefly mined in *Minas Geraes*. The country possesses a great potentiality of hydro-electric power.

The manufacturing industries are rapidly developing. Cotton and woollen manufactures, sugar refineries, breweries and fruit-canning are the main industries. The Government helps these industries by levying protective duties on the imported goods. The principal manufacturing industries are cotton, silk, rayon and wool, jute, paper, tobacco and sugar. The chief exports are coffee, preserved meat, rubber, cotton, hides, skins, leather, tobacco, cocoa, meat, sugar and timber. The imports are mainly manufactured goods. Brazil is nearer to Africa than any other American region. The distance between Dakar (West Africa) and Brazil is only 1,600 miles. Euro-American air service follows this route. *Rio de Janeiro*, the capital of the Republic, is the chief sea-port and possesses an excellent harbour. *Santos*, in the south, is noted for the export of coffee. *Bahia* and *Pernambuco* export sugar, cotton and tobacco.

Argentina, is second to Brazil in South America in respect of size and population. It has an area of 1 million square miles and the population is nearly 16 million, mainly composed of immigrants from Southern Europe.* The density of population per square mile is 15 persons. It is the most progressive State in South America. The climate is generally cool and the land is flat. The cool climate favours European immigration and the flat land permits the easy construction of a net-work of railways in the east of the country. The rivers are Parana, Paraguay and Uruguay, which are all navigable.

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* Estimated population in 1950 was 17·1 million.

The mineral wealth of Argentina is not great. The country is mainly an agricultural one and may be described as the granary of South America. Agricultural development is the greatest in the east, where nearly all the cereals are grown. The principal crops are wheat, oats, maize and oil-seeds. In 1950, Argentina raised nearly 6 million metric tons of wheat, 6 million maize and 1·4 million oil seeds. Cotton, potatoes, sugar, tobacco, rice and yarba mate (Paraguayan tea) are also cultivated. Argentine wheat and oil-seeds have taken a larger market of Indian produce in the U. K. The pastoral industry is of considerable importance. Sheep, cattle, pigs and horses are reared in the south-west. The political power is largely in the hands of the land-owning cattle-breeders. Meat refrigeration is the principal industry and the country has the largest refrigerating plant in the world. Other manufactures are flour milling, textile establishments, machinery and vehicle works, chemical works and tobacco factories.

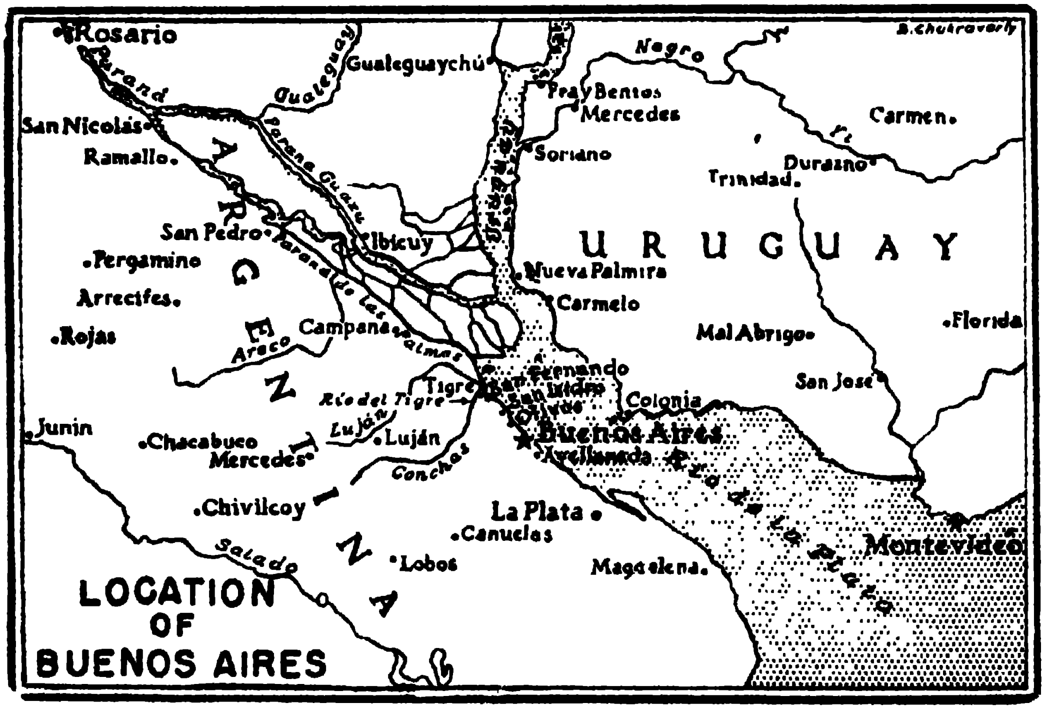

Fig. No. 74.

The Republic has about 27,000 miles of railway line. The lack of uniformity of gauge is the main drawback of the railway system. There is a transcontinental railway line connecting Buenos Aires with Valparaiso (Chile)—a distance of about 900 miles. A new railway line is being completed between Salta (Argentina) and Antofogasta (Chile). There are about 32,000 miles of roads in Argentina, facilitating traffic also with Chile, and Uruguay and Paraguay.

Commodities Exported

(000 metric tons)

	1947	1948	1950
Wheat	2148	1837	2744
Oats	332	572·1	192·0
Meat	641·0	259·9	164·0
Wool	69·1	115·8	80·9
Hides	52·7	82·9	10·7
Linseed	213·0	—	131·74

The chief exports are cereals, meat, linseed, wool and tobacco. Of total exports in 1949, cereals and other agricultural products were 45 per cent, animal products 50 per cent, forest products 3 per cent and manufactured goods 2 per cent. The imports are iron and steel goods, cotton and woollen goods and railway plants.

Buenos Aires, the capital of the Republic, is situated on the river Plata and it is also the chief sea-port. Buenos Aires handles about four-fifths of the imports of the Argentine Republic and three-fifths of its exports. Commercially, socially and economically, the city dominates the whole republic. One serious defect of the port lies in the fact that the river is shallow and requires constant dredging. *Rosario* has an excellent harbour. It is the most important port for the export of wheat ; a good harbour already, the port may develop further in future.

Uruguay, the smallest South American State, lies between the Argentine Republic and Brazil.

Uruguay has an area of 72,153 square miles with 2,318,200 inhabitants (1948). The language of the country is Spanish.

About 50 per cent. of the population are of European descent—mostly Italian and Spanish.

Geographically, Uruguay is a continuation of the warm temperate grassland region of Argentina. The Atlantic washes its shores for 120 miles, and the Plata and the Uruguay for 600 miles. The country is not mountainous but full of low hills. The climate of the country is on the whole warm temperate—the minimum is 35°F and the maximum 90°F.

The mineral resources are gold, copper, silver, iron, tin, mercury, mica, slate, gypsum, cobalt and marbles. But little has been done so far to develop mining industry.

The raising of cattle and sheep is the principal industry, mainly carried on in the south and the west.

LIVESTOCK CENSUS

(*In thousand*)

Cattle	6,821	Goats	17
Sheep	19,559	Pigs	273
Horses	545		

About 60 per cent of the total area is devoted to stock-raising industry.

Animals and animal-products account for 95 per cent. of the country's exports.

Only 7 per cent. of the area is devoted to agriculture. The principal crops are wheat, maize, oats, rice and linseed. The wine industry is of some importance, having an output of over 15 million gallons.

The exports are almost exclusively wool, meat and hides. Other exports are linseed, wheat, maize, oranges and building stone. Imports are fuel oil, petrol, coal, cotton goods, sugar, iron and steel and machinery. Overseas trade is chiefly with Great Britain, U. S. A., Argentina and Germany.

Montevideo on the Plata, with railways running to most parts of the interior, does the whole external trade of the country. The city has many slaughter-houses. The population of Montevideo in 1941 was 770,000. Other cities are Paysandu, Salto and Mercedes.

Peru, north of Chile, is a backward State because of frequent civil wars. It has an area of 514,059 square miles with 7 million population. The average density of population is 11 per square mile. Nearly half the population are white, and 40 per cent. Indians. The economic resources are varied. In the high mountain plateaus, gold, silver and copper are found. Petroleum is also being worked there. At present copper and petroleum are the chief minerals exploited. Crude oil output in 1949 was 13·8 million barrels. Production of copper in 1949 was 28,000 metric tons. Peru is one of the largest sources of vanadium. The agricultural products are sugar, cotton, tobacco, maize, India-rubber and coffee. The chief problem of Peru is its "absentee capitalists". Its oil-fields and other minerals are controlled by the U. S. A. and Canada ; its cotton plantations are under the Japanese and Germans ; the railways are in the hands of the British ; the banks are owned by the Italians ; and sugar factories are controlled by the Germans. *Lima* is the capital and trade centre. The population of the city in 1948 was 767,054.

QUESTIONS

1. Describe the factors that are checking the development of tropical South America.
2. What are the economic products of South America? Show how they compete with the Indian products in the continent of Europe.
3. Give a short description of Brazil and mention its chief exports.
4. Describe the economic resources of Argentina. In which two commodities does the Republic compete with the Indian produce in the U. K.?
5. Discuss the nature of trade between India on the one side and the South American States of Brazil, Argentina and Chile on the other. In what way do you expect this trade to be modified in the near future? (Cal. B. Com. 1935).
6. Describe carefully with the aid of a sketch map the distribution of sheep in South America. Under what conditions does this animal thrive best?
7. Name five principal sea-ports of South America, and point out the parts of the country for which they are trade centres. Mention their chief exports.
8. In what parts of the two Americas can there be surplus production of rice? (Cal. B. Com. 1944).

CHAPTER XIII

AFRICA

Although Africa is adjacent to Europe and Asia and contributed through Egypt to the greatness of the Mediterranean civilisation before the dawn of history yet today, *economically, politically and socially Africa is the most backward of the continents.* Africa has great present and potential wealth in its soil, plants, minerals and labour. It possesses large areas of relatively level land and a small proportion of mountainous terrain. Some of the world's mighty rivers are in Africa. In man-power it stands fourth in the world. As a source of raw materials like cotton, gold, diamond, zinc, tin, phosphate, wool, rubber, hides, graphite, vegetable oil, cocoa and timber, Africa has long been of great value to the colony-holding nations of Western Europe. The continent, however, has several serious disadvantages. These are: (1) lack of *deep indentation and harbours.* The coast-line is remarkably regular and no deep gulfs run into the land. Although in area Africa is three times the size of Europe, its coast-line is less than half as long. (2) The rim of mountains, which almost everywhere borders the continent, causes rapids and falls in the rivers. The Congo, the Nile, Niger and a few other rivers are navigable in certain parts of their courses, but such navigation is only of local significance. (3) Unhealthy climate. Desert conditions prevail in the north-western and south-western sides, while large areas within the tropics are extremely enervating. The interior of tropical Africa, even to-day, remains unexplored because of unhealthy climate. Disease is widely prevalent and has greatly limited the economic growth of the country. These geographical and climatic conditions account for the economic, social and political backwardness of the continent.

The economic development of Africa will depend on the success of solving some problems which at present hinder its progress: (*i*) The difficulty of moving men and goods from one part of the continent to another is the greatest handicap to development and progress. The railways are mostly concentrated in the Union of South Africa. Some points of the vast interior are reached by roads, but most of it is inaccessible even today because of dense forests, disease and wild animals.

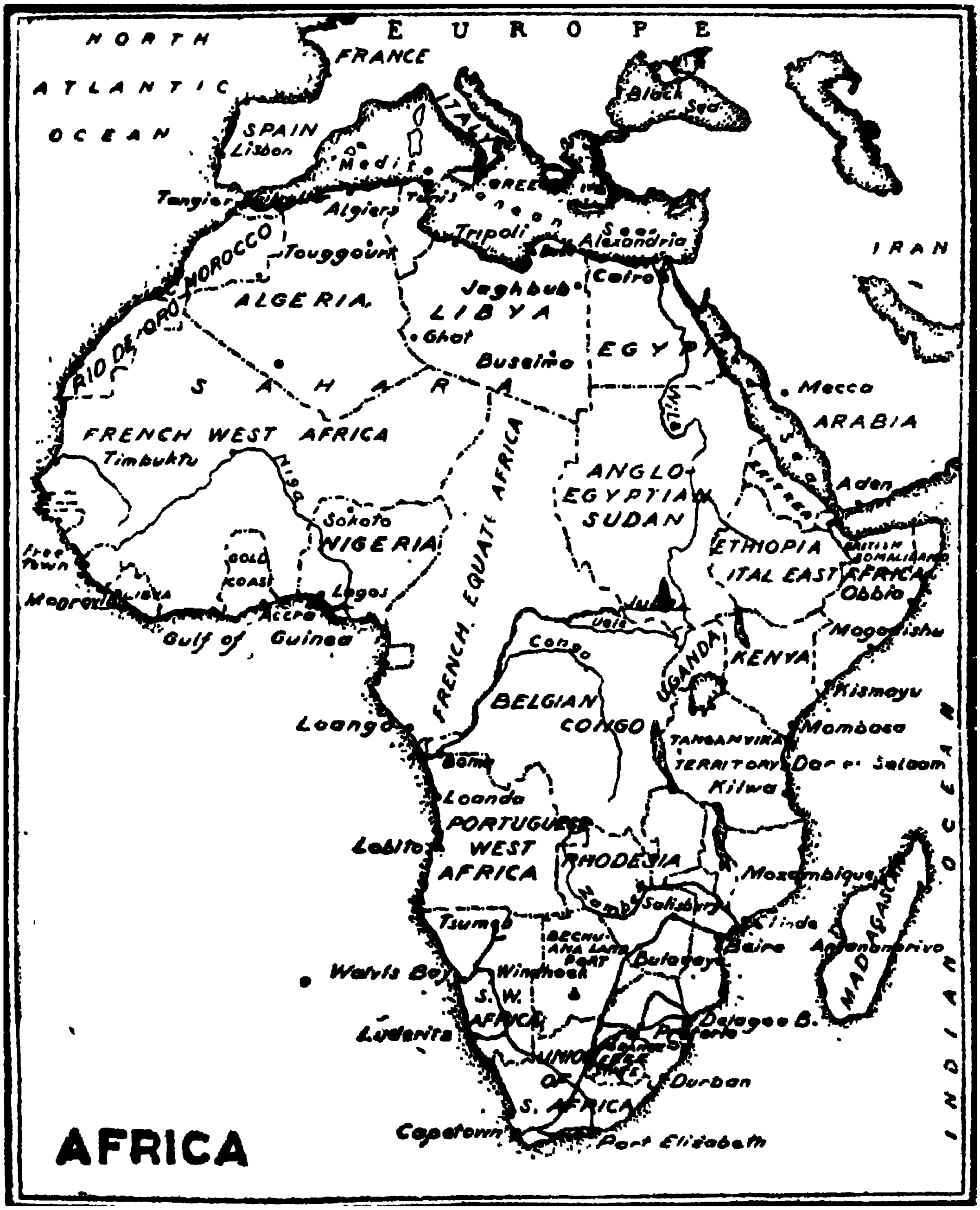

Fig. No. 75. Map showing political divisions in Africa.

There are many large rivers in the continent with flow of water throughout the year but then except the Nile the others flow through undeveloped regions of the tropical Zone. The Nile too has cataracts and falls and is in flood in the rainy season. (*ii*) In Africa the demand for the goods of great manufacturing countries of the other continents is slight. The people have a low standard of living and hence they do not need expensive clothes, houses and furniture. The demand in the world market for the products of Africa is not yet great. Palm oil, copra, cocoa, rubber and other main articles, which the great central part of Africa produces, are supplied more easily by the tropical regions of South-Eastern Asia, West Indies and South America. So long as they can supply the world's demand, Africa is likely to be neglected. The development of the equatorial region of Africa will affect, to some extent adversely, the foreign trade of India. Coffee, copra and rubber of Ceylon and Southern India will have to meet the compétition of the products of Central Africa in Great Britain. But how far the trade of India can be affected will depend upon her success in solving the transportation problems. (*iii*) The mines, plantations and industries are under the control of the Europeans, and the labour is indigenous. The coloured population, however, is vigorous and increasing. Many of them are getting education and training and will soon be capable of managing these industries. The coloured people are already manifesting the stirrings of nationalism and political consciousness. In South Africa the bitter problems of race relations are becoming serious. The Whites in South Africa have imposed several economic and social restrictions against the natives and other Asiatics.

Agricultural and Mineral Production

Production of most agricultural commodities in Africa has increased much after 1939. Increased production is appreciable with regard to the citrus fruit, groundnuts, rubber and sugar.

In the continent of Africa, only three areas are highly developed. These are: (*a*) The French Colonies of Algeria and Tunis, where the Mediterranean climate permits the white people to live and work efficiently, (*b*) Egypt, and (*c*) South Africa. The rest of Africa is very backward, though the economic possibilities are great.

PRINCIPAL AGRICULTURAL COMMODITIES IN AFRICA

(Thousand metric tons)

	1934-38	1950
Citrus fruit	325	717
Cocoa	730	770
Coffee	2,420	2,100
Cotton	6,000	5,260
Groundnuts	8,800	10,200
Oil palm products	810	873
Rubber	94,609	1,879,699
Sisal	245	310
Sugar	18,400	23,100
Tea	440	550
Tobacco	2,710	3,100
Wool	1,728	1,871

OUTPUT OF PRINCIPAL MINERALS IN AFRICA

(Thousands of metric tons)

	1938	1950	World percentage*
Antimony	1,397	10,761	28·3
Asbestos	78	174	16·4
Chrome ore	211	376	47·0
Coal	17,065	30,035	2
Cobalt	2,965	6,208	87·4
Copper ore	424	500	22·2
Diamonds (thousand carats)	9,366	14,869	94·4
Gold (thousand fine ounces)	13,991	13,436	55·4
Iron ore	3,097	3,931	4·2
Lead ore	52	108	7·2
Manganese ore	592	820	54·2
Phosphate rock	3,780	6,155	31·9
Silver	160	249	4·7
Tin	22	24	14·4
Zinc	37	129	6·8

Political Africa may be divided into six divisions: (1) British Africa, (2) French Africa, (3) Belgian Africa,

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* Excluding U.S.S.R., China. Source: *Summary of Recent Economic Development in Africa,* U.N.O., 1952 April.

(4) Portuguese Africa, (5) Italian Africa, and (6) African Africa, (*i.e.*, independent States).

British Africa may again be subdivided into: (*i*) British East Africa, (*ii*) British West Africa, and (*iii*) British South Africa.

The population of Africa is about 160 million, of which nearly half are the followers of the Prophet. In Africa, the whites are outnumbered by about 35 to 1. The native population of Africa may be divided into three groups: (*a*) pygmies, (*b*) negroes and (*c*) Hamites. The pygmy tribes are very primitive in their mode of living and are mostly found in the Congo basin. They don't practise agriculture but live by hunting animals and birds. The negroes are found from the southern part of Sahara to Cape region although their number predominates in the Savannah. They live in established villages, rear cattle and practise agriculture. The Hamites are most civilized and have a higher standard of living than that of the Negroes. The northern part of Africa is the real home of the Hamites. The Hamites are mostly Mahomedans.

British West Africa includes Gambia, Sierra Leone, the Gold Coast and Nigeria. The approximate area is 371,393 square miles, and the population in 1946 was 23 million. The economic development of the Colonies is hindered by the unhealthy climatic conditions, disease, difficulty of penetrating inland and the lack of good harbours along the coast. West Africa, lacking in natural harbours, has always a problem in loading and unloading ships. The coast is flat and sandy, with heavy and continual surf and ships have to stand off in the sea while canoes ply to and fro through the surf with cargo and passengers. Recently however a harbour has been opened at Takoradi in Gold Coast. The harbour is artificially constructed with mooring accommodation for vessels of different sizes. The West Colonies are not suitable for white settlement. The work is always done by the natives.

Gambia. The climate and soil are ideal for growing groundnuts, and this is the chief occupation of the Protectorate. The country is unsuitable for the European settlers and farming is carried on by the natives. Though the predominant export crop is groundnut, considerable quantities of rice, maize and cotton are also grown. The seat of the Government is at *Bathurst*.

Nigeria has approximately an area of 373,000 square miles with 25 million population. The region produces cocoa, palm-kernel, groundnuts, mahogany and gum arabic. The natives have worked iron, lead and tin. There are also deposits of silver, galena, manganese ore, lignite and monazite. The principal ports are *Lagos, Warri, Burutu, and Victoria.* Numerous rivers and creeks form the chief routes for transport. There are 1,500 miles of railway lines which handle annually 1·3 million tons of goods (1949).

Lagos is the seat of the Government.

The Gold Coast is rich in agricultural and forest resources. The majority of the inhabitants are farmers. The important products are cocoa, kola, oil-palm product, copra and other food crops. Rubber and cotton are also produced in small quantities. Mahogany is the most important timber export. Gold, manganese and diamonds are produced in the Gold Coast by the Europeans. The road-system has been improved recently and there are at present 6,400 miles of motorable roads. The rivers are not navigable. There is a total of 500 miles of railway lines. The principal trade centres are *Kumasi*, *Accra* and *Sekondi*.

Sierra Leone. The country, as a whole, is flat and low-lying in the south and west, and broken and elevated in the north and east. Rice is the most important crop and the staple food of the people. Other important food crops are maize, millet, groundnuts and cocoanuts. The principal exports are oil-palm products, kola, ginger, cocoa, coffee and chillies. Some minerals are found in Sierra Leone, *viz.*, iron ore, diamond, gold and platinum. But up till now they are not commercially exploited. There is no large organised industry, but there are several cottage industries, such as the weaving of cloth, manufacture of mats, etc. These productions are mainly for local use. *Freetown*, the principal trade centre is situated at the northern extremity of the peninsula on a fine natural harbour.

British East Africa. In East Africa, British territory stretches unbroken from the Anglo-Egyptian Sudan to the Union of South Africa. The territory has an area of 224,960 square miles with 20 million population. Uganda, Kenya, Tanganyika and Nyasaland lie entirely in the tropics ; but the climate is very suitable for white people to settle, as these areas lie chiefly on the high plateau at an elevation of more than 4,000 ft. to 6,000 ft. The temperature is reduced by altitude and the Europeans can settle there permanently. East Africa has consequently developed much, and the bulk of cultivation is in the hands of the Whites. But in these areas also the White people require the aid of the natives. Coffee, tea, maize, sisal and wheat are crops of major importance. Dairy and wool industries are important, and considerable quantities of hides are exported annually.

Uganda has an area of 93,981 square miles. Within its boundaries lie part of Victoria Nyanza, part of Lake Edward, Lake George, half of Lake Albert, Lake Kioga, Lake Salisbury and the course of the Nile. Indeed, Lakes and rivers cover 13,680 square miles of the total area.

The population is 5 million according to 1948 census. Uganda lies on a high plateau. The temperature is moderate and varies only slightly throughout the year. The resources of the Protectorate are principally agricultural. Agriculture, including the rearing of livestock, is the principal occupation of both the natives and the European settlers. The prosperity of Uganda has been closely bound up with the cotton crop, and the extension of roads and railways and the expansion of towns are responsible for the rapid progress made in this industry during the last twenty years. In 1950, Uganda had 1·6 million acres of land under cotton cultivation with production of 330,000 bales. The other crops are tobacco, coffee, tea and rubber. Some tin, gold and salt are mined. The tin mine opened at Mwirasandu in South Uganda is of considerable local importance which employs more than 500 persons. The tourist-traffic of Uganda is important. The attraction of Uganda to tourists lies largely in the variety of its interesting scenery and of its animals. Certain areas have been set aside as game reserves. Communications are maintained by railways, waterways, roads and airways. *Entebbe* is the capital. *Kampala* is the commercial centre and *Jinja* is a port on the Lake Victoria.

Kenya is a large tract of territory in East Africa. It has an area of 220,000 square miles with 5·3 million population.

The northern part of the Colony, comprising three-fifths of the whole, is arid and comparatively waterless. The southern strip, in which almost all economic productions are centred, comprises a low-level coastal area and a plateau raised by volcanic actions to a height varying from 3,000 ft. to 10,000 ft. The resources of the Colony are principally agricultural. Coffee, maize, sisal, wheat, tea, sugar-cane and cocoanut are the chief crops. Agricultural production in Kenya is subject to certain handicaps. The principal productive areas are remote from the coast, and transport charges are high by reason of the fact that almost all the goods are to reach their market *via* the Suez Canal. The Colony is self-supporting in all animal products and has built up a certain export trade with the neighbouring countries. Dairy produce is also exported to Europe. Mineral resources are not yet fully explored, though considerable quantities of gold, silver, gypsum, marble and soda ash are known to exist. *Nairobi* is the administrative capital of the Colony. It is also the focus for air routes served by European and Far East lines. *Mombasa* is the chief port.

Tanganyika Territory. The Colony belonged to Germany before the First Great War and was known as German East Africa. It is one of the primitive countries of Africa. In area, this territory is larger than Germany, Denmark, Holland, Belgium and Great Britain combined. Agriculture (including stock-rearing) is the most important source of wealth of the country and is the principal occupation of the European settlers and natives. The chief crops are sisal, coffee, tea, tobacco, cocoanut, wheat, barley and cola. Animal husbandry fills a very important place in the native life of Tanganyika and is the principal occupation of the pastoral tribes. Mica, tin, coal, manganese and diamonds are known to exist. Sisal is Tanganyika's most important export. Next to sisal, diamond is the most valued export mostly obtained from a single mine which perhaps is the largest single diamond mine in the world. In 1947, some £1 million worth of stones were produced.

Communications are a weak point. There are two railways: (*a*) the central line from Lake Tanganyika to Dar-es-salaam, and (*b*) a shorter line from Moshi to provide an outlet for the coffee and sisal plantations at the port of Tonga. *Dar-es-salaam* is the chief port and capital.

Zanzibar and Pemba. These two lands lie off the coast of Tanganyika territory. Both the islands are low-lying. Though the climate is hot, it is not unhealthy to the European settlers. The agricultural produce for export purposes consists almost entirely of cloves and cocoanuts. The internal communications of Zanzibar and Pemba are carried on by roads and seas. There are no railways. Zanzibar was formerly the chief port of the east coast but with the rise of Mombasa and Dar-es-salaam it has lost a considerable trade.

Nyasaland is essentially an agricultural country. Agriculture is the principal occupation of both the Europeans and the natives. Tobacco, tea, sisal, cotton, rubber and coffee are the principal products. Some minerals occur in the country, *viz.*, gold, copper, iron, mica, coal and manganese. The climate of the Colony is excellent for the European settlers. The Colony is 130 miles away from the coast. Beira, in Portuguese East Africa, carries the trade of the Colony. Zomba is the seat of the government.

Northern Rhodesia. Northern Rhodesia is a vast British territory and it lies on the water-shed of the Congo and the Zambesi. It consists mostly of the high plateau of Africa, but there are low lands in the valleys of the Zambesi, the Kafue and the Loangwa. The temperature is relatively high even on upland and is, therefore, unfit for European settlement. Its white population consists mainly of temporary residents engaged in trading, mining and plantation works. The country possesses great agricultural and pastoral resources. Cotton, maize, wheat and tobacco are the principal crops. Cattle, sheep, pigs and goats are reared in various parts of the territory. Mineral wealth is only beginning to be exploited. Copper, gold, coal, zinc and tin are worked. Pemba and Lusaka are the two trade centres.

Southern Rhodesia. Southern Rhodesia is more developed than Northern Rhodesia. It is mostly a high plateau and has, on the whole, temperate climate. Mineral wealth is the principal attraction for settlement in the country. Gold comes first in importance and is mined in several places. Chromium is found extensively, and Rhodesia occupies a high place in the production of chromium. Silver, lead, iron, copper, coal and tin are also worked. Southern Rhodesia is admirably suited to arable and pastoral farming. Tobacco, maize, and cotton are the principal crops. But stock-raising is more important than agriculture. On the splendid grasslands, which are found all over the Colony, cattle are reared, and much is being done to improve the quality of the animals by the importation of good quality stock cattle from Great Britain. Bulawayo and Salisbury are the principal towns.

British Somaliland, a small territory on the Red Sea, lies between Eritrea and Italian Somaliland. It is of little economic importance and is more important politically. It occupies a position from which it can command the Red Sea. Some agricultural crops like barley and maize are grown mostly for local consumption. The chief wealth of the land is composed of a few sheep and cattle. Berbera and Zeila are the chief towns.

The Anglo-Egyptian Sudan. The Anglo-Egyptian Sudan has an area of 967,500 square miles. The population in 1949 was estimated at 8·3 million. The climate varies greatly from one region to another, and thus helps to produce different kinds of agricultural products. Cotton is the most important crop, which alone constitutes 76 per cent. of the total exports of the country. Cotton is grown in the Gezira, a fertile tract of land between the Blue Nile and the White Nile. This region has been recently irrigated as the result of a great Government scheme, of which the main feature is a great dam at Sennar on the Blue Nile. Cotton is also grown on the north of Khartum in the Nile Valley. The Sudan is the chief source of the World's supply of *gum* arabic, exports of which in 1949 amounted to 34,000 tons. Forests are abundant in the south and along the Blue Nile Valley. Fibres, tanning materials and timber from mahogany and the acacia arabica are the chief forest products. The finest gum forests are in the valley of the Blue Nile. The middle portion of the Sudan is an extensive grassland where a good deal of cultivation and cattle-rearing is carried on. Rubber, coffee and gum are the other products coming from the middle region. The principal highway of commerce is the Nile. The railway runs from Haifa to Abu-Hamed and then goes to Khartum ; from Khartum a line runs to Port Sudan on the Red Sea. Khartum and El Obeid are the principal towns.

Sudan imports sugar, machinery, metal, cotton piece goods, vehicles, oil and wheat. The exports are cotton, gum arabica and salt. Her chief sources of imports in 1949 were U.K.

(33 p.c.), Egypt (16 p.c.), India and Pakistan (15 p.c.). The destinations of exports in 1949 were U.K. (66 p.c.), Egypt (13 p.c.), India and Pakistan (12 p.c.).

The Union of South Africa. The Union of South Africa comprises the Cape of Good Hope, Natal, the Orange Free State and the Transvaal. The total area of the Union is 472,494 square miles. The population in 1947 was 11·2 million of which 2·3 million were Europeans, 700,000 coloured people, 225,000 Indians and 34,000 Malayans. "The Malayans are the descendants of the slaves brought to South Africa by the Dutch in the 17th century from Malaya and their other colonies of the East."*

The climate of the Union is on the whole healthy and is suitable for white men to settle in. This suitability of the climate to the white men has created the race problem because already other races have settled here. South-West Africa which formerly belonged to Germany, is now administered by the Union Government.

The economic development of this British Dominion is the result of the discovery of minerals. The country is exceptionally rich in minerals.

PRODUCTION OF MINERALS IN THE UNION OF SOUTH AFRICA (1949)

	Quantity	Value (in million £)
Gold	11,705,084 fine oz.	49·7
Silver	1,159,375 ,,	0·2
Diamond	1,494,527 metric carats	10·0
Coal	27,000,000 tons	10·1
Copper		3·6
Manganese	644,831 tons (long)	2·4
Asbestos	70,917 tons (short)	2·7

Total value of all minerals raised in the Union during 1949 was £84·1 million.

The two most valuable minerals are gold and diamond. South Africa is almost the only source of diamond and is also

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*P. P. Balsara—*The Union of South Africa.*

a producer of more than half the world's total annual output of gold. "So far the economic structure of the Union has been supported on gold mainly, and the falling off in output that is anticipated suggests an insecurity of basis. New supports to the structure—both industrial and agricultural—are being slowly built, but they may not be sufficiently strong to bear the weight of the edifice in the event of an early exhaustion of the precious metal. That is the critical economic problem confronting the Union today."* The most famous diamond field is at Kimberley in the Cape Province. South Africa is also an important producer of manganese. The most important manganese deposits are in the Cape Province. South Africa has great potential wealth in her fisheries, but up till now they have not been fully developed. The economic development of the region has been hindered by the existence of a large native population and by the fact that much of the manual labour required is provided by the coloured people.

In 1950, there were 13,500 miles of railway lines in the Union. There are good motorable roads which carry a large volume of goods and passenger traffic. The Union has also an efficient internal airways system. Regional air services are operated to Lawrence, Marques, East Africa and Rhodesia. Johannesburg is an important airport.

The Cape of Good Hope Province. It is mainly a pastoral country. The economic development is meagre due to labour and race problems, the difficulties of agriculture and the hindrances to communication. Good natural harbours are almost absent. Rivers are of little use for commerce. Fruits are grown on the south-western side where the Mediterranean type of climate prevails. Mineral wealth is considerable, especially diamond. 90 per cent. of the world's diamonds come from Kimberley. Wheat, oats, rye, tobacco and millet are the chief agricultural products. Cape Town, a port of call, is the capital. Table Bay provides natural shelter for shipping. The hinterland is rich in fruits. The port is also a railway centre and one of the great nodal points in the world's sea-traffic. Of the total population of 17,00,000 only 1,50,000 are Europeans.

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* W. Fitzerald—*Africa*.

Natal. It is a land of perpetual greenness. *Natal is often described as the Garden Province of South Africa.* The province of Natal has an area of 35,000 square miles with 2·1 million population. The climate is sub-tropical on the coast and somewhat colder inland, for which the region is admirably suited to Europeans. Agriculture is the chief industry of the province. Sugar-cane, tea, tobacco, maize, coffee, cotton, rice and bananas are extensively grown. Coal is the chief mineral product. The quality of the coal is the best in South Africa. *Durban* is the commercial centre and chief sea-port. *Petermaritzburg is the capital.* The European population is small. The Indian population is fairly large. It was in 1860 that the sugarcane planters of Natal first imported Indian labourers on the *indenture system* to meet labour shortage due to abolition of slavery.

The Transvaal. The area of the province is 110,000 square miles with 4·1 million population (1946). Mining is the important industry of the province. Gold, coal, iron, diamonds, platinum, lead, silver, tin and copper are the chief minerals. *The Witwatersrand, which lies to the west of Johannesburg, has acquired great importance in recent years on account of the vast quantities of gold which it contains. The rocks consist of a "banket" in which gold lies in particles. Cheap native labour and the proximity of coal contributed to the rapid growth of this industry in Rand.* In 1950, 35 per cent of the world's gold came from this area. Coal is not of good quality, but still it plays a very important part in the industrial development of the country. The diamond mine lies near Pretoria. The important agricultural crops are sugar-cane, cotton and tobacco. Stock-raising is carried on in the high-Veld where cattle and goats are numerous. Pretoria is the capital with a population of 235,000. It is at an elevation of 4500 feet and has a high average humidity. The steel industry is of recent development. *Johannesburg* is the largest city in South Africa and is the centre of the gold-mining industry.

The Orange Free State. The area of the province is 50,000 square miles with about 1 million population. It has a temperate climate and the country is mainly a pastoral one. Cattle and sheep are reared on the high-Veld and also on the grassland in the east of the Province, where the dairy industry has developed. In recent years, agriculture has received great attention. Wheat is cultivated in the south-east in the basin of Caledon river, which has been called "the granary of South Africa". Maize and millets are also grown. The mineral output is not great. Bloemfontein is the capital and the chief trade centre. It is also an important railway centre. It has a population of 84,000.

South-West Africa. Till 1918, it was a possession of Germany.* The country is mainly noted for pastoral industry. *Basutoland* is a mountainous country. The climate is favourable both to arable and pastoral farming. In the *Bechuanaland Protectorate* the population consists entirely of natives. The chief wealth of the Protectorate consists of cattle, sheep and goats.

Egypt

Egypt occupies a very favourable position for trade. It is situated at the head of one of the most important highways of commerce—the Suez Canal route—through which the trade of Asia with Europe is maintained. Egypt has, therefore, a great scope for developing entrepot trade. Geographically, she is the natural gateway between East and West. For long through her passed the wealth and produce of many nations. In her prosperous cities were sold and exchanged the goods of the Far East, of Iran, Babylon and Arabia, of Somaliland and Sudan, of Greece and Rome and of Africa and Spain. Indeed, Egypt dominated the world market.

The climate of Egypt is typically that of desert with the exception of the Northern Delta region which has the Mediterranean climate. Ninety seven per cent. of the area of Egypt is desert. *Without the Nile, therefore, Egypt would have been as barren as the rest of the Sahara.* The Nile irrigates about 12,000 square miles out of a total area of 373,100. Practically the entire population of Egypt (16 million) lives in this irrigated part of the country.

The climatic conditions of Egypt are such that, with the aid of irrigation, the land can be cultivated throughout the year. Agricultural practices in Egypt are a peculiar combination of the ancient and the modern. The hand sickle, the wooden plough, the threshing board and the water wheel drawn by animals exist side by side with great engineering works of irrigation, the disk plough, the tractor and the combine. In Egypt, the use of modern machinery on the farm has been restricted on account of the abundance of cheap labour and the predominance of extremely small farm units. Cotton, sugar-cane, rice, maize and wheat are the principal crops. Cotton is the most important crop on which much of the country's prosperity depends. Cotton accounts for 75 per cent. of the value of the country's exports. Almost the entire output comes from the Southern part of Egypt where irrigation works are highly developed. The quality of cotton is superior to that produced in India.

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* The administration was vested in the Government of the Union by the Mandate of the League of Nations in 1920.

The mineral wealth of Egypt is found in the deserts. Petroleum and phosphates are known to exist in considerable quantities. Egyptian oil output has been steadily increasing from wells along the Red Sea coast. The main production is from one field at Ras Gharib, which yields 1,300,000 tons per year. Large quantities of asphalt are produced. Egypt still imports considerable quantities of oil and particularly kerosene. Her kerosene consumption for cooking and lighting is 400,000 tons, but she only produces 75,000 tons. A new oil field has recently been found at Ras Sadr, on the opposite side of the Red Sea. Only one well has been drilled here and is producing 40 tons a day of good quality oil, free from sulphur. Much importance is attached to this discovery. The next in importance is the phosphate salt mined along the North Eastern coast of the Red Sea. Most of the phosphate is exported to Australia and South Africa. The other minerals are salt, low grade manganese ore, talc and building stones.

The manufacturing industries of Egypt are mostly concerned with textiles, food stuffs and chemicals. The country is now self-sufficient in respect of cotton piece goods, sugar refining and brewing. Cigarette making and cement production are also important. All the industries are confined to Cairo and Alexandria.

The Nile is of great importance to the life and prosperity of Egypt. The main river which flows through Egypt is formed by the union of two main branches, the White Nile and the Blue Nile. Rising in the Lake Victoria on the high plateau of East Africa, the White Nile flows northwards along a flat region. The White Nile has a flow of water throughout the year. The

Blue Nile rises in the Abyssinian mountains. In summer, the Blue Nile is in floods. The two-rivers join at Khartum and flow through Egypt to the Mediterranean Sea. It is navigable without impediment as far as the Aswan dam.

As early as 1902, a dam was constructed across the Nile at Aswan to store water for irrigation purposes. In 1907, the capacity of the reservoirs was increased to 2,250 tons to meet the increasing demand for irrigation water. The dam was further raised in 1929 by another 27 feet. There is another dam across the Nile at Sennar, 2000 miles from the mouth of the river, for benefiting the Sudan along the banks of the Blue Nile known as the Uazira. The Sennar dam was opened in 1926. The Sennar dam is responsible for irrigating 300,000 acres of land and has converted an arid desert into a rich cotton growing country.

There is a plan to stabilize irrigation of the Lower Nile by employing Lake Victoria as the main storage area, Lake Albert acting as a balancing reservoir. As four-fifths of the Nile water come from the Ethiopian sources which are in flood in August and in the lowest flow is in April, the plan envisages the construction of a dam at Lake Tana in Ethiopia.

The railways are worked by the State. The principal line runs from Alexandria to Aswan. From Cairo an important line runs southward and joins the Sudan railway. The Suez Canal lies in Egyptian territory. The Canal gives a great strategic importance to Egypt. The chief export of the country is cotton, which alone accounts for over 85 per cent of the total value of the exports. Other exports are cotton seeds, cereals and vegetables.

Cairo is the capital of Egypt. It is also the largest city in Africa. It stands on the east bank of the Nile at the head of the Delta. Recently it has become an important air port for Europe-Asia route. It has a population of 2 millions. *Alexandria* is a port noted for foreign commerce and handles about 80 p.c. of the country's export trade. *Port Said,* on the northern end of the Suez Canal, is a great coaling station with large entrepot trade. Egypt virtually came under British control in the eighties of the last century. In 1914 she became a British protectorate. In 1936 England recognised her as an independent State. It is now an independent sovereign state.

Ethiopia (Abyssinia)

It is a sovereign independent state with an area of 350,000 square miles. Population is about 10,000,000.* The country is a volcanic tableland, and the climate is healthy and stimulating. Economic progress is slow in spite of considerable mineral, agricultural and pastoral resources. The country has no seacoast and depends on Jibuti, a port in French Somaliland, for its foreign trade.

The country in future can be a great cotton-producing one. The important agricultural crops are coffee, wheat, cotton, barley and pepper. In its rugged hills and valleys the existence of considerable mineral wealth has been reported recently but lack of communications has prevented its exploitation. Transport is extremely difficult by rail and river. The country has rich deposits of iron, coal, copper and sulphur which are not yet industrially or commercially exploited because of the lack of technical personnel, capital and transport facilities. Exports consist mainly of hides and skins, coffee, grain, wax. gold and cotton. Imports are salt (from French Somaliland, Aden and the Sudan), Cotton piece goods (from U.K., U S.A. and India), sugar, glass, motor cars and petrol. *Addis Ababa* is the capital and is situated at an altitude of 8,000 ft. It has 300,000 inhabitants. The other trade centres are Adowa and Gondar.

Algeria and Tunis are the most important States of Northern Arica. They consist of a coastal range. Agriculture is the main occupation of the people. By means of artesian wells the land is irrigated for raising vine, cereals and tobacco. Stock-raising is also of considerable importance. The principal exports are wine, cereals, olive oil, iron, zinc and lead ; the chief imports are textiles, machinery and hardware. *Tripoli* is the capital of Tunis. It is very thinly populated. *Algiers,* the capital of Algeria, is an important coaling station. Both these States are under France.

* Algeria has an area of 847,500 square miles with 8·8 million population. Tunisia is about 48,195 square miles in area. According to the census of 1946, the total population was a little more than 3 millions of which European population was 250,000.

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* "The official estimate (1947) of the population, 15 million, is quite improbable; cautious estimates vary from 8 to 10 millions."—*Statesman,* 1951.

QUESTIONS

1. On a sketch map, locate the distribution of Africa's gold-fields. (Cal. B. Com. 1935).

2. Discuss the present economic condition of South Africa with special reference to its (*a*) mineral resources, (*b*) pastoral industry. (Cal. B. Com. 1926, 1933).

3. Mention the economic resources of the British possessions in equatorial Africa. What are the prospects of developing these resources and how will the Indian trade be affected by this development? (Cal. Inter. 1940; Cal. B. Com. 1928, 1939).

4. "Egypt is the gift of the Nile."—Discuss. (Cal. Inter. 1939, 1942, 1949).

5. Carefully examine the geographical position of Egypt in relation to world trade routes. (Cal. Inter. 1941; B. Com. 1931, 1932).

6. Describe the present development of irrigation in South Africa and examine its possibilities.

7. Account for the commercial and industrial backwardness of tropical Africa.

8. What commercial interests induced Britain to colonise in Africa? (Cal. Inter. 1940).

9. State the situation of and describe the Nile Valley and give a geographical explanation of its importance. (Cal. Inter. 1939, I. I. B. 1929).

10. "The gold-mines are the backbone of South Africa." Discuss the statement.

11. Discuss the nature of the economic development of South Africa as the result of the War. To what extent is that country dependent on India for the supply of consumption goods? Are there alternative sources available now for such goods? (Cal. B. Com. 1944).

12. Discuss the present position of economic development of Abyssinia. (Cal. Inter. 1939).

13. Trace the course of the Nile from its source to the mouth, and show to what extent does this river help in the development of agriculture in Egypt. (Cal. Inter. 1951).

CHAPTER XIV

AUSTRALIA

The Continent-Island of Australia, situated entirely within the South Hemisphere, is rather off from the main trade routes of the world. About 40 per cent. of the area is in the tropics and the rest in the temperate zone.

Generally speaking, the surface of Australia is fairly level, consisting of either plains or plateaux of great extent. In the east, however, a continuous range of highlands runs from north to south for over 2,000 miles. This range is known as the Great Dividing Range. Its distance from the sea varies from 25 miles to 120 miles. The coastal plains are, on the whole, very fertile. In between the Great Dividing Range and the Western tableland are the lowlands. Thus Australia looks like a soup plate—a fertile rim around a desert bowl.

The coast-line of this vast island-continent is generally regular. The eastern side and, to some extent, the north-western side are more or less indented.

The east coast receives abundant rainfall. Northern Australia, which enjoys monsoon winds in summer, also gets plentiful supply of rain. The central part and the west coast of Australia never receive rain-bearing winds and so these parts, collectively, are called the *"dead heart of Australia"*. Speaking generally, more than two-thirds of Australia have on the average less than 20 inches of rain a year.

The continent can be divided into two parts—*Empty Australia* and *Economic Australia.*[*] The line that separates the two runs from "Geraldton, West Australia, passing through Kalgoorlie, Port Augusta, Broken Hill and to the gulf of Carpentaria". North-west of this line lies the dry country which is either useless desert or purely pastoral land of an uneven quality. To the south and east is found the great farming belt extending from Cook Town in Northern Queensland to the coast through New South Wales, Victoria and South

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[*] Taylor, Griffith, *"The Resources of Australia"* (1928).

Australia to Fowler's Bay. About 55 p.c. of the land area of Australia is used for pastoral purposes, 40 p.c. is wasteland, while 2 p.c. is forest and only 3 p.c. is crop and orchard land. If proper steps are taken for irrigation, it may be possible to bring ¼ of the land area under cultivation.

The Continent occupies about 3,000,000 square miles with a population of about 8 million, "the bulk of which live in a narrow belt running from a little north of Sydney round the coast of Adelaide and in the south-west corner".

The average density of population is 2 per square mile.

AREA AND POPULATION IN 1950

	Area sq. miles	Population	Population per 100 sq. miles
New South Wales ...	309,433	3,225,242	1,042
Victoria	87,884	2,202,869	2,507
Queensland	670,500	1,183,792	177
South Australia	380,070	700,257	184
Western Australia ...	975,920	557,918	57
Tasmania	26,215	279,386	1,066
Northern Territory ...	523,620	15,303	3
Australian Capital Territory	939	20,772	2,212
Total ...	2,974,581	8,185,539	275

Immigration has greatly helped the growth of population in Australia, although recently the natural increase has become larger than the gain from immigration. Before 1852-61, immigration accounted for 76 p.c. of population growth in Australia. Since then, immigration rate has declined. The percentage of growth, however, between 1922-1931 from immigration was only 26.* To-day, Australia depends almost entirely on natural increase of population.

The density of population is nowhere high, except in Victoria. The climatic and other factors have led to a very definite concentration of population in the east and south of Australia. The waterless wastes of the centre and west of the continent cannot attract settlers. But there is definitely scope for closer settlement in Queensland, New South Wales, Victoria and South Australia. *Therefore, there is opportunity for the population to be increased many times its present figure.* Thus, in Australia there is an under-population problem. The

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* *Economic Survey of the Pacific area* by K. J. Pelzer (1941). (Institute of Pacific Relations).

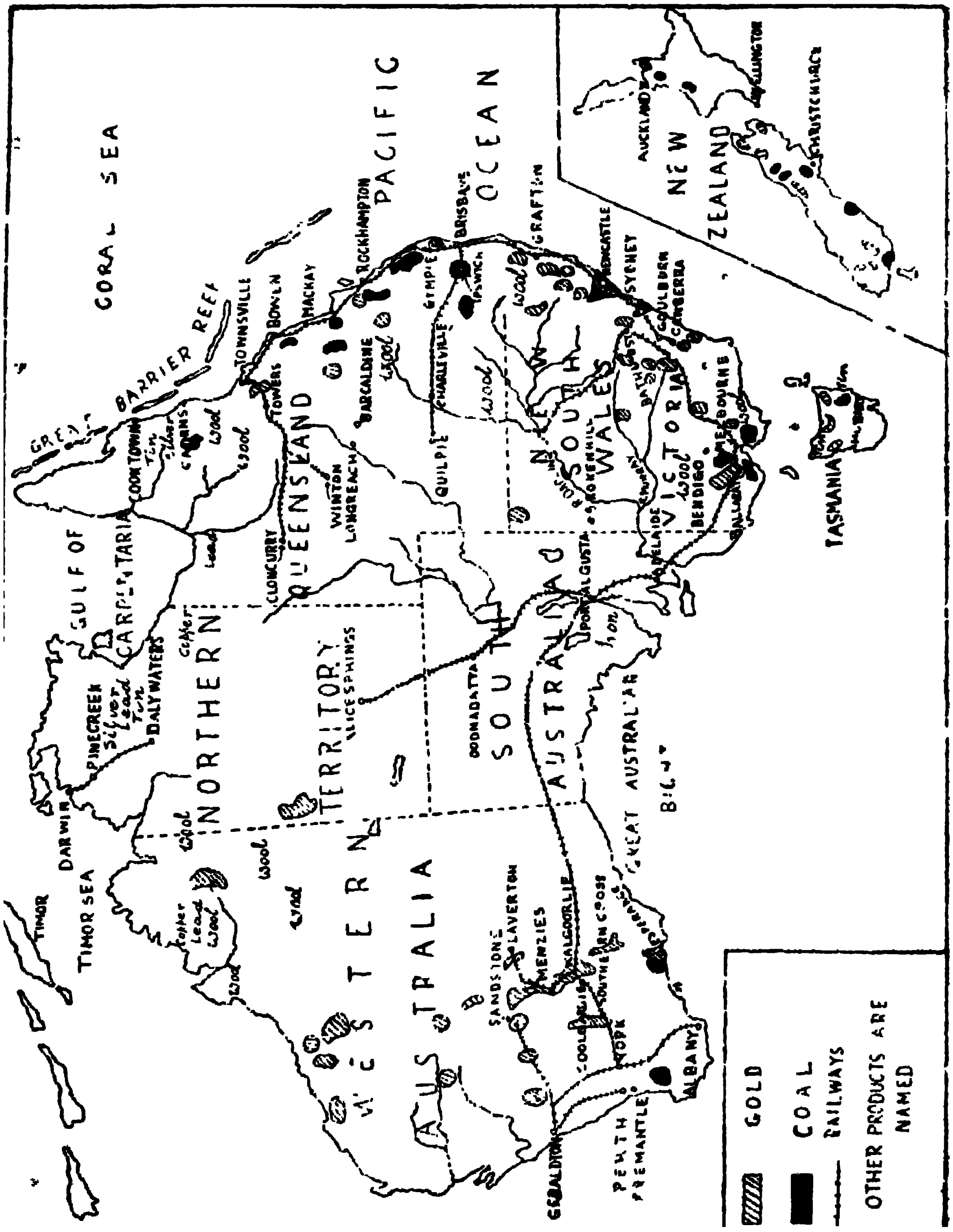

FIG. No. 76. Map showing the economic products of Australia. The coalfields are mostly confined to the eastern coast, also note the concentration of goldfields in the east and south-west.

country can support at least 20 million people. Indeed, the lack of labour is a handicap to the development of industries. Again, though the northern part is very fertile and suitable for the cultivation of rice, sugar and cotton, the Europeans cannot carry on work there as the regions are within the tropics and hence, very hot. Nor does Australia permit immigration of Asian labour. In this connection it is necessary to mention the immigration policy of Australia. The immigration policy, known as *White Australia policy,* has two aspects: to attract economically and socially desirable immigrants and to exclude or limit in number those immigrants who are considered undesirable. *The policy is based on two considerations: sociological and economic.* The sociological consideration is directed against those who are considered incapable of assimilation and to all Asians and even to people from southern and eastern Europe. The economic consideration is the fear that immigration will lower the Australian standard of living and existing wages. Apparently, the policy contains no suggestion of racial bias. The "White Australia" policy must postpone the development of the Northern portion of the country till the White settlers sufficiently acquire knowledge and capacity to conquer tropical diseases. The immigration policy of Australia did not raise bitterness and resentment in Asia so far because of two factors. Australia was not—until the World War II—considered even remotely a portion of the Asian Continent as the people were mostly European there. Moreover, South-East Asia was too much busy to throw away the European Imperialism. Now that most of the countries in the South East Asia are independent, her peoples have begun to resent the policy of Australia.

Australia is deficient in waterways. The rivers of Australia are short and rapid. The Murray, the most important river, is in the south. The tributaries are the Darling and the Murrumbidgee. Although the length of the Murray is 1,300 miles, it is of little use for navigation. During the rainy season, steamers can ply between Albury on the Murray and Bourke on the Darling. The railway system is being gradually developed. There is one serious defect in the railway system. Different States adopt different gauges on which the lines are built; these involve many changes. Australia has a railway mileage of about 27,000. There is one trans-continental line running from Perth to Port Augusta, the distance being 1,425 miles. The climate and relief of the country also permit easy development of air-traffic. In 1949 there were 48,239 route miles of air services in Australia.

The economic development of the country has been greatly influenced by its geographical location and conditions. The great distance of the Continent from Europe and America is responsible for the slow settlement. "If it had not been for the discovery of gold, the process of occupation would have been even slower than was the case. But the mineral wealth of Australia, besides attracting a considerable number of people to its shores, gave it a supply of capital which was of great advantage to its development, and on the decline of gold production in the eastern States, the inhabitants began to settle down to agriculture and pastoral farming."

Cultivation does not occupy a large area in Australia. The total area of all crops in 1949-50 was a little more than 20 million acres.

AREA AND YIELD OF CROPS IN 1949-50

	(000 acres)	(000 bushels)
Wheat ...	12,240	218,221
Oats ...	1,748	27,421
Barley ...	1,040	19,543
Maize ...	194	6,313
Sugar cane ...	281	6,849

More than half the total cultivated area is under wheat, which is a winter crop and is reaped in early summer. The chief wheat-growing areas are in the fertile plains of the Murray basin and in the Mediterranean areas. The major portion of Australian wheat goes to the United Kingdom, but some of it is also sent to China and Japan. Australia exported her first consignment of wheat in 1897. Adelaide is the chief wheat exporting centre. Next to wheat, maize, barley, sugar-cane, oats and rice occupy the largest area. Rice has become an increasingly significant crop in Australia since 1925 when it was first raised commercially in the *irrigated area of New South Wales.* By the late 1930's Australia was producing for her own needs as well as a little quantity for export. During the World War II when the important rice exporters of South-East Asia were under the Japanese domination, the demand for Australian rice increased considerably. A new rice area was opened in 1944 in New South Wales.

From the point of view of land use, Australia is more suitable for pastoral than agricultural industry as three-quarters of the country is too dry and hot for agricultural pursuits. Most of this dry, hot country can rear some livestock.

LIVESTOCK IN 1949-50

	Number (in 000)
Sheep	112,891
Cattle	14,640
Pigs	1,123

Today, sheep and cattle-rearing are the two great livestock industries of the country. *Sheep-rearing is very important in Australia, where the number of sheep exceeds that of any other country except Russia.* Sheep are reared mostly for wool in New South Wales, Queensland, Victoria, Western and Southern Australia. But *the country raises wool more for export than for turning it into finished product within the country.* The U. K. is the single largest customer of Australian wool, taking, as she does, more than 30 per cent. France, Japan, Belgium, and Germany are the other buyers. Cattle are reared for beef and dairy produce in Queensland, Northern Territory, coastal lands of New South Wales, Victoria, and the south-west of Western Australia.

The mineral wealth of Australia is considerable. In 1948 about 750,000 persons were employed in the mining industry. In the beginning gold was the chief metal which attracted immigrants to Victoria and New South Wales. Even now gold is an important product of Australia, where more than 4 per cent. of the world's total production is raised. In Victoria the chief gold centres are Ballarat and Bendigo. New South Wales is now-a-days less important for gold. In Queensland, the chief centre is Rockhampton. At present more than half the total production comes from Western Australia, where it is worked in two main centres—Coolgardie and Kalgoorlie. Gold production in 1949 was 899,000 fine ounces.

1 *Coal* is the most important mineral product of Australia. It is found in New South Wales, Queensland, Tasmania, S. W. Australia and S. E. Australia. In 1949 coal output was 15 million tons. 2 *Iron ore* occurs in South Australia. Silver is found in many parts of the Continent. The most important *silver* mines are found in New South Wales, where it is worked in the Broken Hill district. *Lead* and *zinc* are also obtained from the silver mines of the Broken Hill. *Tin* and *copper*—though abundant—are not worked efficiently at present. The most important copper mines are found in Northern Queensland and South Australia. Of precious minerals, *diamond* and *sapphires* are found.

One of the world's biggest hydro-electric projects is now under way in Australia. It will double the Continent's power potential and greatly add to the world's food supplies. This is the Federal Government's £A200 million Snowy-Mountains hydro-electric and irrigation scheme. It will have an installed plant capacity of at least 2,620,000 kilowatts, impound 400,000 acre feet of irrigation water and provide power for key defence research projects in an easily defended area. Completed scheme will rival the famous Tennessee Valley Authority of the U.S.A. and take at least 25 years in the making. In the confined and tunnelled drop from the mountain dams to the rivers of the plain the rushing water will generate electricity equal to the total output of all steam-power stations in Australia today. After driving the power stations the water will be used for irrigation.

The development of manufactures is hindered by scanty and widely scattered population, poor progress of rail and railroads and the overwhelming importance of agriculture and mining. Within recent years Australia has developed a wide variety of manufactures by policies of high tariff protection and subsidies to local industries. The World War II also gave a tremendous boost to Australian industries.

Manufacturing is now Australia's single biggest economic activity, employing more people than the agricultural, pastoral and mining industries put together. In the first three post-war years Australia opened 8,445 new factories and engaged 100,000 more factory workers. The engineering and metal industries have forged ahead of the others. They employ 320,948 workers, 80·7 per cent. more than in 1939. New industries include the manufacture of motor cars, tractors, earth-moving equipment, news-print and rayon-weaving. Flour-milling, weaving and spinning of wool, furniture-making and iron and steel are the important industries. This last group is of special interest for the future of manufacturing as the Australian steel is as cheaply produced as any steel in the world.

The most important exports of Australia are wool, wheat, gold, hides and. skin, butter, flour, cane sugar, frozen meat, mutton, fruits, wine, cheese, metals, machine tools, machinery and engines.

Wool—U. K., France, Japan, Germany, Belgium, Italy, U. S. A., U. S. S. R.

Wheat—India, U. K., South Africa.

Of the total exports, nearly half goes to U. K.

The chief imports are metal and metal goods, textile fabric and apparel, foods and drinks, drugs and chemicals and paper. Great Britain is the chief supplier. More than 40 per cent. of the total imports come from the U. K.

The chief cities are Sydney, Melbourne, Adelaide, Brisbane, Perth and Hobbart. *Melbourne* is the capital of Victoria and is the chief sea-port and the manufacturing centre ot the State. *Sydney*, the capital of New South Wales, stands on the south of Port Jackson. It possesses a fine harbour. Besides being the industrial and political centre, it is also the chief naval station in Australia. *Brisbane* is the capital of Queensland. It is the chief port and industrial centre of the State, from where wool, frozen beef, butter, bacon, ham, pork, hides and fruits are exported. *Adelaide* is the capital of South Australia. Its port is Port Adelaide. The chief exports are wool, wheat, flour, copper, skin, frozen meat, fruits and wine. *Perth* is the industrial, commercial and political centre of Western Australia. Its port is Freemantle. The exports are mainly wool, gold and timber. *Hobbart* is the capital and chief railway centre of Tasmania. It has a fine harbour and has trade mainly with Sydney. The exports are wool, gold, tin, silver, timber, fruits, jam and grain.

New Zealand

The Dominion of New Zealand includes North Island, South Island and Stewart Island and several groups of small islands lying at a distance of 150 to 350 miles in the surrounding seas. The total area is 103,723 square miles and the population 1·8 million (1947 census). About 93 per cent. of the population is European.* At the beginning of the 19th century there were only a few hundreds of white people. Immigration had played a very important part for the growth of New Zealand's population till the late seventies of the 19th century because of the extensive activities of the colonising companies and the gold rush. Most of the immigrants were from Britain. Now, of course, the natural increase is more important. *Pure Maoris* who were the original inhabitants of the Dominion constitute only 4 p.c. of the total population. Anglo-Maoris accounts for 2·5 per cent. and others ·5 per cent.

South Island and North Island are the largest and they make up the greater part of the Dominion. *New Zealand is sometimes called "the brighter Britain of the South".* It is the only part of the British Empire that resembles Great Britain in its life and habits, scenery, temperature and size. The British emigrants have now permanently settled in New Zealand and they comprise nearly 95 per cent of the white population.

The temperature and rainfall of New Zealand are mainly controlled by the fact that the greater part of the Dominion lies within the influence of the sea. Summers are not very hot, nor are the winters cold.

The surface of all the islands is highly mountainous. In the South Island, there is a mountain-range from south to north on the western side. This range is known as the Southern Alps and it is covered by perpetual snow. The most extensive plains in New Zealand are those called the Canterbury plains which occupy the middle of the South Island on the eastern side. *New Zealand is essentially a pastoral country and 96 per cent of its utilized land serves pastoral industries.* Crops are produced for the most part for fodder for the cattle, dairy and sheep farming.

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* Like Australia, this Dominion has also followed a White policy in respect of immigration. But as the country is too remote, this policy has not so far raised any bitterness in Asia.

In 1949 New Zealand had 33 million sheep, 4 million cattle and half a million pigs. "The uncrowned king of the country is sheep." In New Zealand the number of sheep per square mile is greater than that in any other country of the world. In mild climate and rich pastures, coupled with the introduction of refrigeration and the utilisation of by-products, have made sheep farming very successful. On all the plains of New Zealand the sheep is extensively reared for wool and mutton. The Canterbury plains with the surrounding downs are the most famous fields for sheep-rearing, where more than one-fifth of the flocks of the Dominion is found. The rearing of cattle for the meat and dairy produce is becoming very important. The dairy industry of New Zealand is run on a co-operative basis and is strictly supervised by the Government "to ensure that no goods are exported which will damage the reputation for good produce which New Zealand holds".

The total area under cultivation in 1949 was a little above 20 million acres. The chief crops are wheat, oats, barley, potatoes and fruits. Of minerals, New Zealand has small quantities of many. Lignite, silver, gold, coal and petroleum are obtained, though with the exception of coal, these are not highly developed. New Zealand's production of minerals in 1949 included 84,000 ounces of gold, 233,000 ounces of silver, 25 tons of tungsten ore, 3 million tons of coal, 230,000 gallons of crude petroleum and 4,000 tons of iron ore.

New Zealand is largely dependent upon overseas sources for their manufactured goods. The second World War presented both a challenge and an incentive to the expansion of domestic industries. The falling off of imports, difficulties of shipping facilities and the demand for increased local production gave healthy incentive to industrial development. Though industrial activity in New Zealand increased during the War period, the expansion was hampered by lack of capital and also the difficulty of obtaining supplies of iron and steel, machinery and machine tools. As a result, her industry continues to be mainly concerned with the treatment of her primary products. Sparse population and distance from great industrial countries prevent it from becoming a great manufacturing country. Leather-goods-making, woollen and flax manufacture, fruit canning, furniture-making and raising of dairy produce are some of the important industries. In 1949, about 143,000 persons were employed in manufacturing industries.

Although the rivers of New Zealand are numerous, these are, for the most part, unfit for navigation. New Zealand has over 3,500 miles of railway, which have been greatly influenced in their direction by relief features. The mountainous relief of the country has necessitated the construction of tunnels frequently at great expense. Roads are fast developing in New Zealand.

The pastoral character of New Zealand's development can be at once understood from exports like wool, butter, frozen meat, cheese, hides and skin which account for nearly 90 per cent of the total value of her exports. The chief imports are motor car, oil, timber, cigarettes, iron and steel plate, manufactured cotton and wire for fencing. The Dominion has the greatest trade relation with Great Britain. New Zealand has to rely on U.K. for more than 80 p.c. of her exports while nearly the whole of her import trade is confined within the Commonwealth. The other countries with which the Dominion has trade relations are the U. S. A., France and Germany.

The chief trade centres are Wellington, Auckland, Dunedin, Christchurch, Nelsons and Invercargill. *Wellington* is the capital of the Dominion and is situated on *Port Nicholson* in the North Island. It is the most important collecting and distributing centre of the country and handles a large coastal traffic. *Auckland* is the largest town in New Zealand. As it is situated on a narrow Isthmus of the North Island, it has become important for sea-traffic. Dairy produce is an important item of export. It is the centre of the gum-collecting and gold-mining industries. *Dunedin* is the principal town of the South Island. *Invercargill* is another chief town of the same island. *Christchurch* is an important town of the Canterbury plains of the South Island.

QUESTIONS

1. Outline the outstanding geographic factors which have determined Australia's economic development.
(Indian Institute of Bankers, 1934).

2. Why does not Australia, which is a larger producer of wool, develop extensive woollen manufactures? (Cal. Inter. 1934).

3. Describe the principal industries of Australia, including agriculture. (Cal. Inter. 1940).

4. What are the principal exports from Australia and New Zealand? Discuss the possibilities of increased exchange between these countries and India. (Cal. B. Com. 1936).

5. Discuss the development of east and west coasts of Australia and show how far the influence of climate is responsible for such development. (Cal. Inter. 1940).

6. "Isolation and a small population have been potent forces in retarding the development of Australia." Discuss this statement. (Indian Institute of Bankers, 1942).

7. Account for high density of population in the south-eastern parts of Australia. (Delhi Univ. B.A. Hons. 1951).

[In Australia, the average density of population is only two per square mile. The continent is, therefore, "the most scantily peopled civilised area in the world." Nearly 50 per cent. of the population lives in the capital towns of Brisbane, Sydney, Melbourne, Adelaide, Perth and Hobart.

[*The distribution of population has been influenced by rainfall, temperature, irrigation facilities, minerals and means of communication.* The Desert Region of Australia where the rainfall is less than 10 inches, is practically uninhabited (one person per eight square miles). The Northern Savannah lands have one person per square mile because the areas are hot all the year. Victoria and southern parts of New South Wales are the most densely peopled areas of Australia. The rainfall, in these regions, varies from 20 to 30 inches. The eastern coastal region has many large cities, all of which are ports. The population is, therefore, dense here. The lower part of the Murray Basin has high density of population because of the extension of irrigation works. The denser population in some parts of the West Australia is accounted for by the discovery of gold-mines.]

8. How is the normal surplus production of wool in Australia and New Zealand being consumed today? (Cal. B. Com. 1944).

9. Give an account of the distribution of population in Australia. (Cal. Inter. 1949, 1951).

10. In recent years the commercial progress of both South Africa and Australia has been remarkable. How has this been possible? (Cal. B. Com. 1949).

11. Australia has made rapid progress in developing the industry of food preservation. How has this been possible and which countries are her buyers? (Cal. B. Com. 1951).

CHAPTER XV

ASIA

Asia is the largest and the most populous of the continents. With an area of about 17 million square miles, Asia occupies nearly one-third of the land surface of the globe. It extends from arctic to equatorial zone. There are now 20 political states in Asia with 1,187 million population in total. Asia's population, which is more than half of the world's total, is mostly confined to the south-eastern side in India, Java, China and Japan.

In Asia there are certain great physical disadvantages for the development of commerce. (1) Its size and topography. Asia's great size makes the interior very dry, because sea-winds do not blow over it. The size also fosters isolation and backwardness inasmuch as transportation by land is more difficult than by water. The relief of Asia is unfavourable to commerce because the north is separated from the south by a series of mountains radiating from the Pamir Plateau. From the Pamir, the Himalayas, the Karakoram, the Tien-shan and the Altai mountains extend to the east, and the Hindukush and the Sulaiman mountains to the west. Again, the east is cut off from the west by deserts and mountains. Communication, therefore, between the east and the west as well as between the north and the south, is difficult and in some places impossible. (2) Climatic extremes and contrasts in Asia are the result of its size, shape and relief. The northern side, which covers more than half of the continent, has a climate unsuitable not only for agriculture, but also for human health and efficiency. The deserts of the interior are totally barren. It is only in the south-eastern parts of the continent where climatic Monsoon and Equatorial conditions favour agriculture and other industries.

From the point of view of race, language and religion, the countries of Asia differ widely.

Races at all stages of development are found within Asia. About three-fifths of the total population of Asia belong to the Mongolian races, and the areas inhabited by them are Siberia, Japan, Korea, Manchuria, Mongolia, China, Indo-China, Burma and the Himalayan slopes, the East Indies, the Malaya Peninsula and Formosa. The Caucasian races in Asia are found in Upper and Middle Indo-Gangetic Plains, in Iran, Afghanistan, Syria, Iraq and Arabia. Negroid characteristics are found in some of the inhabitants of the Malaya Peninsula, the Andaman Isles and South India.

The average density of population in Asia is about 70 per square mile. The distribution of population is very uneven in Asia. Population is very dense in the Indo-Gangetic plain of India, coastal China, Japan and Java where we find more than 100 people per square mile. Population is very sparse in the high plateaus of Central Asia and Arabia as well as in the cold regions of North Asiatic Russia. In certain countries like China, India and parts of South-east and also in Japan and Korea, the pressure of population is acute. The rate of natural increase per annum is always high despite great mortality rate. In Europe, the surplus population during the 19th century migrated to the American continent, while in Asia, the surplus population never found an adequate outlet in new lands. The average density of population per square kilometre is as follows: India 105, Ceylon 104, China Proper 99 Java and Madura 382, Japan 204 and Korea 125. This average density is very high in comparison with industrialised countries. For example the average density in 1947 for U.S.S.R. was only 9, for U.S.A. 18, and for France 73. *The population density in terms of cultivated area is still higher in Asia,* e.g., India, 345, Pakistan 408, Japan 1300, Korea 629, Java and Madura 452, China Proper 425, Ceylon 444, and Burma 240.

In the production of rice, millets, tea, oilseeds, sugar cane, rubber, cotton, tobacco, cinchona, silk and soyabeans, Asia occupies a high rank among the continents of the world. About 95 per cent of the world's production of rice comes from Asia. In 1949-50, Asia had 191 million acres of land under rice cultivation out of world's total of 204 million acres. *Asia has almost virtual monopoly in the production of tea, jute, plantation rubber and soyabeans.* In the production of cane sugar, Asia contributes about one-third of the world's total cane sugar.

Her position in cotton production is second among the continents. In 1950-51 Asia raised about 10 million bales of cotton (of 478 lb. net each) out of world's 27 million bales.

In each country of Asia, agricultural production occupies the most important position. Even in Japan in 1947, 52 per cent. of the population were employed in agriculture. In India it is 67, Siam 89, Korea 73, Burma 70, Philippines 69 and Malaya 61. "This predominance in agriculture in Asian countries is in striking contrast to the industrially advanced countries such as Great Britain, U.S.A., Germany and France where the proportion of gainfully employed population in agriculture were respectively 6 p.c. (1931), 17 per cent. (1940), 26 p.c. (1939) and 36 per cent (1931)." Again, in many countries, the crops are limited in variety. "Three countries have over 70 per cent of their total acreage under rice, namely, Siam with 94 per cent. (1937-38), Indo-China with 83 per cent. (1937) and Burma with 72 per cent (1940-41). Other countries, mainly in South East Asia, also have a high percentage of acreage devoted to crops produced largely for exports, such as tea, sugar cane, jute, abaca and rubber." For this reason, the economy of some countries is very uncertain and vulnerable.

The vast size of the continent could not keep the foreign trade at a distance. For many centuries before the advent of the Europeans in Asia, India, Iran and Western Asia had a flourishing foreign trade. The Arabs monopolised it and passed on the merchandise to the Italians. It was to capture this trade that the Portuguese, the British, and the French merchants came to India. The opening of the Suez Canal and the political domination of Europe over Asia have changed the nature of that foreign trade. Asia supplies the world market with raw materials and food-stuffs, and provides a vast market for the products of the industrial countries of the West.

Asia is often divided as: (*a*) Far East, (*b*) Middle East and (*c*) Near East.

The Far East comprises generally Indian Union, Pakistan, China, Malaya, Thailand, Indo-China, Indonesia and Japan. The Middle East includes Afghanistan, Arabia, Iran, Iraq and the Hejaz. The Near East ordinarily covers Palestine, Syria and Asia Minor. The Far East—namely, Indian Union and Pakistan, China and Japan, is highly developed. Rice, cotton, jute, tobacco, sugar-cane, opium, silk, timber, petroleum, tea, coffee, etc., are extensively found. The business activity is the greatest in the Far East. The Middle East offers unique opportunities for further economic development: here petroleum, gold, wheat, coffee, cotton, hides and skin are extensively raised. Lack of communication and political disturbances are the present obstacles.

Mention may be made here of the Colombo Plan. The Colombo Plan for co-operative economic development in South and South-East Asia represents a major Commonwealth initiative in seeking to bring stability and prosperity to the countries of South and South-East Asia. The purpose of the Plan is to give effect to the determination of Commonwealth countries to make a concerted effort to promote economic and social development in the area and so to raise the standards of living of its people. The basis of the effect is self-help and mutual help working through a co-ordinated programme of development in which it is open to the non-Commonwealth countries interested in the area to participate.

At Colombo from January 9-15, 1950, a Conference was held of Foreign Ministers representing the eight Commonwealth countries—the United Kingdom, Canada, Australia, New Zealand, South Africa, India, Pakistan and Ceylon. The purpose of the Conference was to exchange views on world problems, with particular reference to South and South-East Asia and the possibility of promoting economic development and raising living standards. The Ministers recognised that joint action was necessary if an effective attack was to be made on the problem of poverty and want in the area. The conference set up a committee to consider ways and means of carrying out the proposal for co-operative economic development. The consultative committee met at Sydney in May 1950 and formulated two decisions: (*a*) 6-year Development programmes and (*b*) Technical assistance scheme.

The conference met again in London in Sept., 1950 and accepted the details of the Development and Technical assistance schemes of the different countries of South and South-

East Asia within the Commonwealth. The countries of the area not in the Commonwealth are also showing great interest in the Plan.

Japan

The industrial development of Japan has taken place within the last sixty years. Indeed, its development is phenomenal. The favourable geographical situation in relation to China and other Eastern markets has offered her sources of raw materials and markets for manufactured goods. Its industrial development is the outcome of the governmental efforts.* The Japanese Government, in the early stages of its growth, started factories, brought foreign experts, opened banking institutions and introduced the methods of the leading industrial nations of the world in the country. Its climatic conditions favour the production of certain raw materials, such as silk. Supply of labour is abundant and cheap. Moreover, the people lead a frugal life. The Japanese people, being animated by a desire to make their country independent and respected, made superhuman efforts to make the country industrially great.

There are many striking points of resemblance between Japan and the United Kingdom. Both consist of islands and are situated in the temperate latitudes. Both are, again, great naval and world powers. Both in area and population, Japan proper somewhat exceeds the British Isles having 159,000 square miles as against 121,000 square miles and 69 million population compared with 48 million. Like Britain, Japan is close enough to the continent to receive its civilisation and religion—and yet far enough to maintain its own independent characteristics.

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* The industrial growth of Japan has been the result of a policy aiming at making the Empire an economic unit as completely self-contained and self-supplying as her physical limitations would permit. "There has now grown up in Japan a generation equipped with the necessary knowledge and skill which is able to profit by the experience —both the achievements and the mistakes—of other industrial countries." The industries no longer require grants and subsidies of the state, and the only form of government help is at present protection by import-tariff. The Japanese Government, however, takes positive steps to direct the course of industry and trade by legislation.

Both the countries have large territorial possessions to provide ready markets for goods.*

Japan proper has the shape of a banana fruit and consists of four main islands of Hokkaido, Honshu, Kyushu and Shikoku. These four islands have an area of 142,000 square miles (as constituted after World War II). It is mountainous and lies in the earthquake zone in the monsoon region. "There is an average of four a day, but the shocks of a very serious kind only occur once in six or seven years." The climate of Japan is a mixture of continental and maritime elements.† Climate is wet in summer and dry in winter. The temperature of both the seasons varies with latitudes and also with the influence of the sea currents. Winters are very cold on account of the North-west monsoon and the Berring current. In summer, Northern Japan has 80°F. temperature, which is warmer than that of any other land in the same latitude on the western coast of Europe. The mountains, directly facing the monsoon, keep the west drier than the east in summer ; so Eastern Japan has a mild winter except where the cold currents influence the climate. Typhoons appear frequently in September and cause much destruction on the coast.

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* Before the World War II the Empire of Japan consisted of five large and about four thousand small islands.

	Area in square miles (000 omitted)	Population (000 omitted)
Japan Proper	148·8	69,254
Possession :		
Formosa	13·9	5,213
Karafuto	13·3	332
Korea (Chosen)	85·5	22,899
Leased territories :		
Kwantung	1·3	1,145
South Manchurian Railway zone	·1	523
Mandate :		
Pacific Islands	0·8	103
Japanese Empire	263·4	99,469

The Japanese Empire has been disintegrated after the World War II. Korea is independent; Manchuria and Taiwan have been restored to China; Southern Sakhalin and the Kurile Islands are under Russia and the Ryukyu Islands are under the American occupation.

† There are striking contrasts in the climatic conditions of Japan. The sub-arctic features are present in the norhernmost islands, while in the southernmost they are sub-tropical. The cold, dry north-westerly winds of winter that sweep across Siberia gather up the moisture over the Japan Sea and deposit it in a snowfall along the western side of Japan. The Pacific coast, however, has sunny winter.

Japan is remarkable for the length of its coast-line which is approximately 17,000 miles and gives a ratio of one mile of coast to nine square miles of land. Most of the lowlands which are areas of dense population and large scale production, have sea-frontage. Consequently the people have a maritime outlook. Unfortunately, however, deep indented coasts where natural harbours are many, have in general hinterlands of rugged terrain, and therefore unsuitable for the development of major ports. The productive plains have coasts of shallow water. Even at the estuaries, sediments are deposited, necessitating constant dredging operations to permit ships to reach the river entrance. There are few rivers in Japan and none of them are practically good for navigation, for their course is short and they run through mountain slopes. However, they are useful for irrigation and as sources of power.

The mountainous character of the surface greatly limits the productive area. Agriculture is possible only in about one-sixth of the total area of the country and is practised on an intensive method. In 1949 arable land totalled 16 per cent of the land area. About 34 million people depend directly on farming. Small and scattered fields do not permit use of labour-saving machinery. Even then, the yield per acre is very high because of unusual amounts of hand labour and fertilizer used. Rice occupies the largest area. Japan specialises in the production of rice. In 1947 rice area occupied 53 per cent of the total cultivated area. Output of rough rice in millions of lbs. averaged 26,700 in 1950. The yield per acre in 1949 was 35,000 lb., by far the largest in Asia, but well below that in Australia (45,000 lb.). This high degree of specialisation in rice crop is due to sub-tropical climate in Southern and Central Japan, abundant summer rainfall and easily irrigated alluvial lowlands. Other crops are wheat, tea, barley, millet and pulses. The degree of self-sufficiency in foodstuffs is much higher in Japan—it being 95 per cent higher than in many other industrial countries. About 40 p.c. of the people are engaged in agriculture.

Japan rivals Canada and Scandinavia in the matter of forest resources and their exploitation. About 55 per cent of the area of Japan is forested. The forest area in 1949 was 51 million acres. The economic value of her forest lies in its being a source of timber, charcoal, wood fuel, wood pulp and various foods such as nuts, fruits and bamboo shoots. Timber accounts for 54 per cent of the output of forest products, charcoal coming next with 24 per cent. Timber production in 1947 was 5,468 million broad feet, including 609 million for pit props, 87 million for railway sleepers and 74 million in veneer logs. Timber is obtained from coniferous and broad-leaf forests of pine, oak and maple. She is also rich in bamboos, cypress, camphor tree, lacquer tree (used for varnishes), wax tree and mulberry trees.

Japan is very much under-developed in animal industries because of environmental and economic handicaps. Although the country has a rough land, the slopes are very steep for the grazing of cattle. Moreover, the sub-tropical climate of the country does not permit cultivation of fodder grasses ; the grasses of the hill lands are harsh, coarse and innutritious for cattle. The domestic market for milk and milk products is extremely limited because the people have no taste for dairy products. Sheep-raising is also handicapped by long, hot, humid summers. People have to depend for wool, milk, butter and cheese and leather on foreign countries.

Fishing is extra-ordinarily important in the economy of the Japanese nation. Japan is the world's greatest fishing nation and the annual catch amounts to 20-25 per cent of the world's total. Coastal fishing is the most important in Japan in which more than 90 per cent of fishermen are employed. The products of coastal fisheries are sardines, herring, mackerel, trout, cod, dog salmon, yellow trail, flat fish and shell fish. The deep sea-fishery is also becoming important. The industry is carried on in Korea, Formosa and at Sakhalin.

In Japan, the population is increasing very rapidly. In 1950 the population was more than 83 million in Japan proper. Since then there has been an annual increase of not less than 800,000 people. There is an average density of 500 persons per square mile. This pressure of a rapidly increasing population is a very serious problem of modern Japan. The Government is giving particular attention to the improvement of agriculture, reclamation of wastelands, development of manufactures and expansion of foreign trade with the object of solving the problem. Agriculture alone cannot support the increasing population which will require new land four to five times greater than what she has. Japan has 2,774 persons per square mile of arable land compared to 2,170 in Britain, 1,709 in Belgium, 806 in Germany, 819 in Italy and 467 in France. At present only 15 per cent. of the total area is arable, and

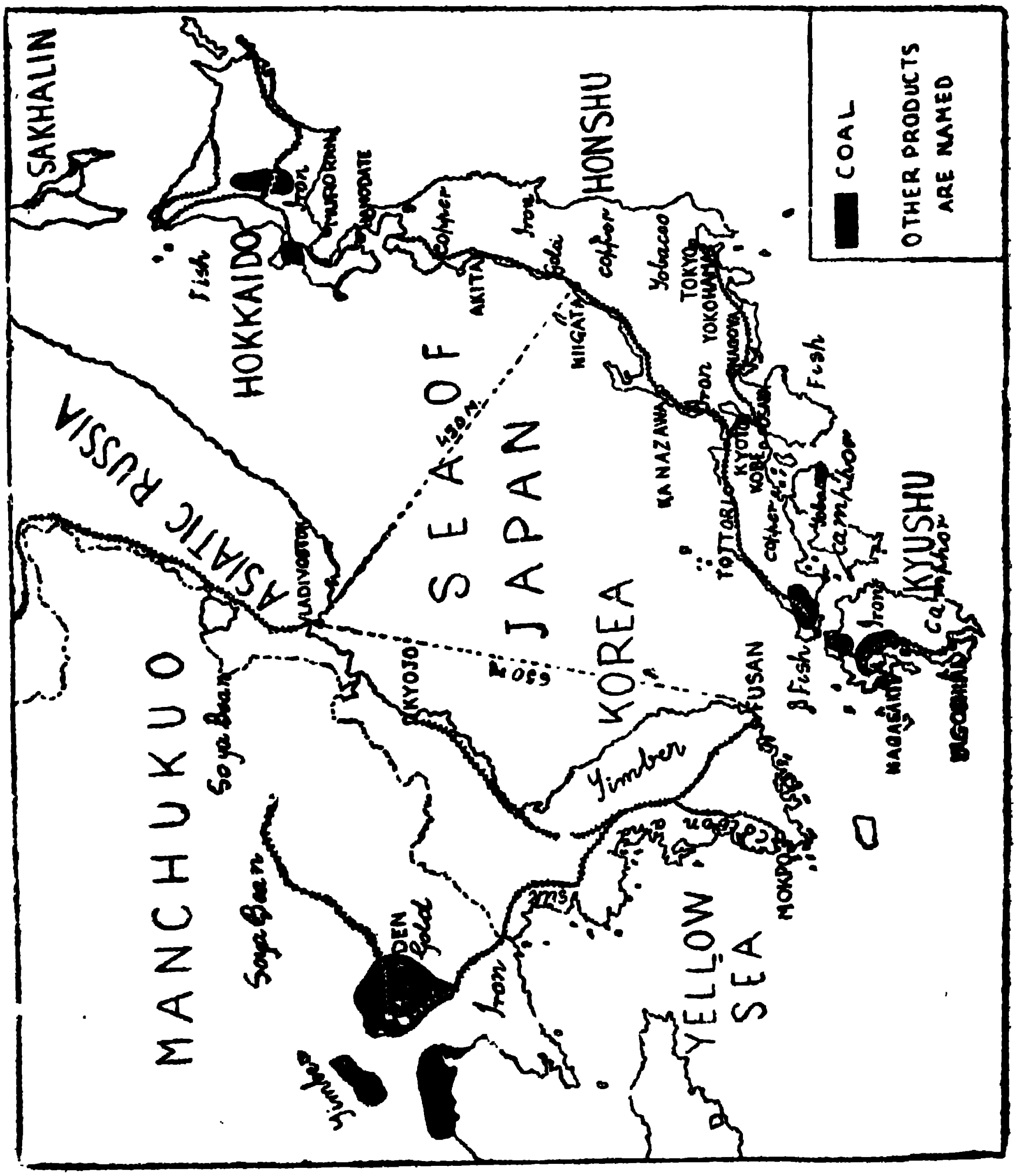

FIG. No. 77. Map of Japan showing her economic products.

with careful attempt 5 million acres of new land may be reclaimed. People are also encouraged by the Japanese Government to migrate to foreign lands, particularly to Brazil, Peru and Argentina. But emigration from Japan was never very effective inasmuch as only a few thousands leave the land annually for settling outside. The statistics indicate that before 1939 the total Japanese who settled outside was hardly 2 million. Besides, even to-day there is great racial prejudice against the Japanese in America. It is doubtful whether Japan would be able to solve her problem of population through migration. The real solution lies in turning to commerce and manufactures, and in migrating to sparsely populated parts of Asia, *i.e.*, Hokkaido, Karafuto, Korea, Formosa and Manchuria.

Communications. Owing to the mountainous character of the country, the development of the means of communication in Japan has been slow. At present there are only a little over 10,000 miles of railways. The difficulties of communication by land, and the facilities for it by sea, have naturally encouraged the growth of a strong mercantile marine.

One of the most serious handicaps of Japan's industrialisation is the *poverty of minerals.* The country is poor in most mineral resources except coal, gold, copper and sulphur.

MINERAL PRODUCTION IN JAPAN IN 1950-51

(In metric tons)

Asbestos	5,446
Chromite	27,003
Copper (smelter)	74,036
Copper (mines)	32,741
Gold (Kilos)	2,815
Graphite	16,816
Manganese	92,947
Mercury	94
Pyrite	535,082
Sulphur	62,480
Silver (Kilos)	89,804
Tungsten	17
Petroleum (in 000 barrel)	1,393
Coal (in 000 metric tons)	40,370
Iron Ore	832,900

Coal is the most important mineral of Japan. It provides more than 60 per cent. of the value of her mineral output. The coal-fields of Japan are scattered throughout the islands from Sakhalin to Formosa. Northern Kyushu and Hokkaido are the leading producers. Kyushu alone raises more than 60 per cent. of the total output of Japan's coal. The Chikuho field of Kyushu is situated near the sea and is an area of dense population. Hokkaido supplies 17 per cent. of the total output. The poor transportation facilities and the scanty population are responsible for the smaller output of coal.

Next to coal, gold is the most important mineral product in Japan. Mining operations are confined to northern Honshu and Southern Kyushu. Gold ore is commonly found in association with copper and silver ores.

The next important mineral is copper. It constitutes 13 per cent. of the total mineral value of Japan. Copper is found in many places throughout the islands. More than 75 per cent. of the total copper comes from the five mines of Ashio, Besshi, Kosaka, Hitachi and Saganoseki. Japan ranks fourth in copper production, being surpassed by the U. S. A., Chile and Canada.

The fourth important mineral product is petroleum. In 1949 Japan raised 1·3 million barrels of crude petroleum. Such an output is of no world significance, for, Japan is outranked in oil production by some 17 countries and her contribution is only 0·12 per cent. of the total oil production of the world. The oil-fields are found in western Honshu. Small oil-fields are also found in Hokkaido, Formosa and Sakhalin. Sulphur is abundant in Japan. This is due to the volcanic nature of the island. This mineral is mainly used in fertiliser industry. The percentage of sulphur output against internal demand is normally 156 and so leaves a large surplus for export.

The iron-ore deposit of Japan is not considerable. There are only two important fields—one at Sendi on the east coast of Honshu and the other at Muroran in Hokkaido. Lead, silver, zinc, tin, manganese and antimony are also mined.

Japan is rich in water-power. The rugged surface of the islands, the swift-flowing streams and the heavy rainfall provide ideal conditions for developing hydro-electricity. Most of the larger power sites are located on the eastern and southern slopes of the mountains of central Honshu. The first hydro-electric plant in Japan was started in 1892 in Kyoto on a stream flowing from lake Biwa.

Hydro-electric power consumption in 1950 was 32,542 milion kwh. The hydro-electric power in Japan is mainly used for industry, urban transportation and lighting the houses. 91 per cent. of the residential households and industrial buildings are wired for electric purposes. Even in an industrially advanced country like the U. S. A., only 75 per cent of such buildings are wired.

Several important manufacturing industries have been established in Japan.

INDUSTRIAL PRODUCTION IN 1949-50

Cotton Textiles:	
Cotton Yarn	345·7 million lbs.
Cotton Cloth	923·4 million square yards.
Woollen Textiles:	
Woollen Yarn	23·2 million lbs.
Worsted Yarn	13·0 ,,
Woollen & Worsted Cloth	34·4 million square yards.
Silk	148,100 bales.
Rayon	72·2 million square yards.
Pig-iron	1·6 million metric tons.
Crude Steel	3·1 million metric tons.

Japan has made remarkable progress in the textile industries, which employ more workers than all the other industrial groups combined, and their products form the basis of the Japanese export trade.

Family monopolies are a feature of Japan's industrial economy. Before the War, 15 combines monopolised 70 per cent. of the country's industry and finance. Four families controlled one-third of Japan's industry, and 60 per cent. of stock on Japanese exchange.

The reeling of raw silk is the most important single industry in Japan. Japan is the leading silk-producing and exporting country in the world. But it is really surprising that Japan has not developed the silk-weaving industry. More than 80 per cent. of the silk produced in the country is exported in its raw state.

Japan's industrial progress may be measured by the growth of the *cotton manufacturing industry*. "The industry is favoured by the cheap labour, the proximity of coal, the comparative ease with which raw material can be obtained from India, China, and the U. S. A., and the neighbourhood of the vast Chinese market for the manufactured commodities." Osaka, Kobe, Nagoa and Tokyo are the manufacturing centres.

Osaka is known as the Manchester of Japan. The expansion of Osaka has been very great during the last 20 years. It is the largest city in Japan with a population of 2,259,000. It is situated near the sea coast ; small steamers can bring cotton to the mill-area by canals or rivers. It contains more than one-tenth of the spindles of the country. Unlike the silk industry, cotton establishments obtain all their raw materials from foreign countries, and in normal years raw cotton is the most important single item of import.

Japan is specially weak in iron and steel industries. Because of their vital importance in the industrial system and in many schemes of national defence, the Japanese Government is giving much assistance to those industries. At Yawata in Northern Kyushu, a big iron and steel-work has been established. There are 31 iron and steel firms, of whom 5 process from pig iron to steel. The open hearth steel capacity is about 8 million tons —the largest firm alone has the capacity of 2 million tons of pig iron. Ship-building is carried on in Nagasaki and Kobe.

Matches, umbrellas, toys and paper are the important products of other industries. Rubber industry is of growing importance. Recently the Japanese have made much progress in chemicals. The pottery-works of Japan are beautiful and have world-wide demand.

Japan has increased the volume of her foreign trade to a large extent. The prosperity of the country depends on the ability of importing raw materials, exporting manufactured goods, and keeping a favourable balance of trade. From the very beginning of her industrial days, it has been a constant struggle for Japan to balance her imports with her exports, and till 1934 her imports were greater than exports.

In 1950 Japan's foreign trade amounted to $820 million for exports and $959 million for imports.

DIRECTION OF TRADE IN 1949

	Import (by p.c. of value)			Export (by p.c. of value)	
Asia	*18·7*	*52·9*	*North America*	*65·5*	*17·3*
China	5·0	2·3	U.S.A.	64·1	15·4
Pakistan	1·7	3·1	*Europe*	*6·8*	*14·0*
India	1·3	12·7	*Africa*	*4·5*	*10·8*
Thailand	2·1	6·4	*Australia*	*3·6*	*4·1*

Till the outbreak of the Second World War the U. S. A. was the most important partner of Japan's trade. The U. S. A. alone provided 25 per cent. of Japan's imports and took 17 per cent. of her exports. About one-third of the total foreign trade of Japan was with her colonies and dependencies (30 per cent. of imports and 35 per cent. of exports).

DIRECTION OF JAPAN'S FOREIGN TRADE (IN P.C.)

Exports to	Asia	62	Imports from	Asia	49
,,	U. S. A.	17	,,	U. S. A.	25
,,	others	21	,,	others	26

After the World War II, the structure and scale of Japan's industries fell considerably. Despite manifold difficulties—political and economic—Japan has made amazing economic recovery. Japan today stands on the threshold of a new phase of her economic recovery programme. She is expanding her production, increasing export trade, enlarging her mercantile marine and re-establishing her pre-war contacts with the world markets. In the beginning of 1950, the trends of her economic recovery were as follows compared with pre-war level:

Industrial Production	90 p.c
Foreign trade	70 ,,
Agriculture Forestry	100 ,,
Fishing	100 ,,
Standard of living	80 ,,

A plan has been formulated by the *Far Eastern Commission* for Japanese industrial recovery within the period of 1952. In the plan, great emphasis has been laid on the development of machine and chemical industries including rayon manufacture. Recently a trade agreement has been reached between Japan and five commonwealth countries (Australia, India, New Zealand, South Africa and U. K.). According to agreement, Japan will supply cotton textiles, industrial machinery, raw silk, rolling stock, chemicals, rayon, wool, silk and paper. In return, the commonwealth countries will send raw wool, iron-ore, salt, raw cotton, cereals, petrol, rubber, tin, jute, oilseeds, coal, manganese and leather.

TRADE CENTRES AND PORTS:

The most important trade-centres and cities of Japan are Tokyo, Osaka, Nagoya, Kobe, Yokohama and Kyoto. These cities are grouped very close to one another and none of these are far from the sea.

Osaka is the business centre of Japan. It is often addressed as City Smoke, for there are many mills and factories in the city, whose smoke keeps the town under a cloak of grey all through the year. It is particularly important for cotton manufactures. It is located on the Osaka Bay at the eastern end of the Inland Sea and has connection by water with the rest of Japan and with foreign countries. Moreover, in the city itself facilities for water transport are excellent. It is sometimes called the Venice of Japan. But the hinterland is very poor in raw materials. Cotton spinning, printing and book binding, manufacture of machinery, iron and steel materials, paper goods and ship-building are the activities of the city. "Because of water transport within and without the city ; because of its wide expanse of level land ; because of the accessibility to raw materials, fuel and labour ; and perhaps to a less degree because of a supply of capital originating from the commercial activities of the feudal period, Osaka has surpassed all other cities of Japan in industrial development."

Kobe, only 20 miles from Osaka, is a port and possesses a deep natural harbour. As the city is confined to a narrow coastal strip, there is no room for industrial expansion. A high and continuous row of hills surrounds Kobe and the city is only 2 miles long and 1 mile wide. Its activities are ship-building, match industry and rubber manufacture.

Tokyo, the capital, is situated on the eastern coast of Honshu. It is the third largest city in the world. Its two ports are Yokohama and Tokyo. *Yokohama* is one of the finest harbours of Japan. It is large, deep and well protected. Tokyo harbour is shallow and large vessels cannot enter there. The principal industries of Tokyo are printing and book binding, the manufacture of electrical apparatus, the manufacture of hardware, and the manufacture of glass and rubber. Earthquakes frequently destroy the buildings and industries of the city.

Nagoya is situated on the south shore of Honshu between Osaka and Tokyo. Its harbour is artificial, and it is of no importance as a port of call for the steamship lines connecting foreign countries. The great Mitsubishi aeroplane manufacturing factory is located in the city. The reeling of raw silk is the most important industry. *China and porcelain* and weaving of cotton cloth are the other activities. *Kyoto* is an old industrial city of Japan. It is the cultural centre of the Japanese empire. *Wakayama* is situated 40 miles south of *Osaka.* It is an important manufacturing city.

Korea (Chosen)

Korea is located on the eastern margins of China. It is a peninsula cut off from the mainland by a broad mountainous base. The total area of Korea is 85,226 square miles with a little more than 25 million population. As it is surrounded by China, Japan and Russia, the independence of Korea has always been insecure. In 1910 it was annexed by Japan. After the defeat of Japan in 1945, Korea was divided into two portions by the 38th parallel of latitude. North Korea, that is, the region above 38th parallel of latitude, remained a Russian sector while South Korea came under the trusteeship of America. This arrangement was to continue for five years from 1945 after which Korea was promised full independence. The Russians and the Americans set up different systems of government within their zones. After the withdrawal of Russians in December, 1948, North Korea was declared a *'people's Republic'*. South Korea, that is, the region below 38th parallel of latitude, was declared a Republic in August, 1948. As yet, the North and South Korea have not joined in a united country. The arbitrary division along the 38th parallel cannot change the people and culture of Korea. Ethnically and linguistically, they are distinct from the Chinese and the Japanese.

North Korea is 48,000 square miles in area with 8 million population while South Korea covers 37,000 square miles with 20 million population.

Korea is a mountainous country, especially the northern and eastern parts. The west and south are somewat plain where most of the agricultural land is found. About 76 per cent. of the total area is covered by forests. The forests are, however, not in a good condition because of reckless cutting and neglect of afforestation in the past. Today the southern hill-sides have become almost barren. In the mountainous forest-regions of the north and Middle Korea, cultivation is carried on in the hill-sides. The farmers burn the forests and plant buck wheat and millet. When the yield declines, the farmers shift to another hill-side to open up land. As a result, there is now a good deal of forest devastation and soil erosion. The eastern coastal region is narrow and is, therefore, not important for agriculture, which is mainly confined to the lowlands in the western parts. Cropland occupies about 21 per cent. of the total area. Rice, millet, tobacco, beans, cotton, hemp and other monsoon crops are cultivated. Rice is the most important crop and its cultivation covers about 27 per cent. of the cropped area. In Northern Korea, barley and wheat are grown as summer crops. The Japanese encouraged the cultivation of cotton in Korea. Korea has rich mineral deposits in several regions. The mineral wealth consists of gold, coal and iron. These minerals were mostly worked by the Japanese. Gold mining is carried on mostly in South Korea. Iron and coal are abundant in North Korea. Zinc, lead and mica are also found in fair quantities.

Industries are highly developed in North Korea. Cotton textiles, hydro-electric power, chemical works, cement works, petroleum refinery are all in the Northern Section. In fact, North Korea is not only highly industrialised, but is self-sufficient in food also. About 230,000 people were employed in industries before the Second World War. The important manufacturing centres are Pusan (for silk), Kenjiho (for steel) and Musan. There are 3,500 miles of railway in Korea. *Seoul,* the capital, is connected with Mukden by rail.

Formosa, also known as Taiwan, lies in the Eastern Pacific Ocean, being separated from China by the Strait of Formosa. Its length is about 250 miles with an average width of nearly 80 miles. It has an area of about 14,000 square miles. The total population of the Island is 4 million. The Island is mountainous and possesses a tropical climate. The population is mostly confined to the plains of the northern and western

Formosa. The Chinese inhabit the plains while the Malayans have settled on the hill-sides.

About 75 per cent. of Formosa is forested. "The tropical lowland forests of the island have been cleared by Chinese peasants so that at present the coniferous forests in the mountains are the sources of lumber." Forests of the region yield various products, of which camphor is the most important. The climate and soil favour agriculture, and the principal crops are rice, tea and sugar-cane. Mineral wealth includes coal and petroleum, though production is yet very small. *Keeling* is the main trade centre and port.

QUESTIONS

1. In the course of thirty years Japan has made great progress in the matter of industrial development. State briefly how it has been possible for her to do so. (I. I. B. 1934; Cal. Inter. 1935, 1951).
2. What are the principal industries of Japan? Where are they situated? State the sources of supply of the raw materials of those industries. (Cal. Inter. 1936).
3. Estimate and locate the mineral wealth of Japan. (Cal. B. Com. 1932).
4. Give an account of (*a*) the natural resources, and (*b*) the climatic conditions of Japan, and show how they have affected her development. (Cal. Inter. 1933; Delhi 1951).
5. Write a short geographical essay on the population problem of Japan (Cal. B.A. 1942).

China

China covers nearly one-fourth of the surface and contains nearly half the inhabitants of all Asia.

The frontiers of China merge with Korea, Siberia, Soviet Turkestan, Afghanistan, India, Burma and Indo-China. The total area is about 4·4 million square miles. It is approximately the size of Europe excluding Russia. It is indeed a continent, containing as it does over twenty provinces which are comparable, alike in size and population, to some of the countries of Europe.

The coastline of China covers a distance of 5,430 miles from the mouth of the Yalu river in Liaoning to Thunging in south-western Kwantung. The northern coast is fringed by shoals, and navigation depends to a great extent on channels cut by rivers.

China has three divisions: (1) China Proper, (2) Eastern Turkistan, and (3) Tibet. Manchuria and Mongolia, which formerly were under the political control of China, are now separate States.

China is a vast country with rich mineral, agricultural and forest resources. Her soil is fertile and rivers are valuable for irrigation purposes. In spite of such vast resources and population, *China is industrially under-developed. Her share in the world's trade is scanty.* Certain geographical conditions are responsible for her slow economic development. 1. With the exception of the eastern part, the country is surrounded on all sides by mountains and deserts which render communication with the rest of the world difficult. This isolation was a factor which kept the people ill-informed of what was happening elsewhere. Only less than a century ago the country came in contact with Europe and America. 2. She has only one opening to the sea—the eastern coast. 3. The products of the western side cannot be conveniently brought to the eastern side as the distance is too great and the means of transport are inadequate. The need for foreign trade is little felt in the country because of diverse climates and products. When there is deficiency of food in one region, it is supplied by other regions of the country. The extension of railways has taken place only in the north; in the south railways are very few. 4. The Government is weak and treats the foreigners with suspicion. Foreign merchants and foreign shipping are restricted to certain ports, known as 'Treaty Ports'.

With her resources and population China may become in future one of the greatest industrial countries and potential markets of the world. The majority of its people are docile, diligent, devoted to work and cheerful.

Agriculture is the main industry of China. The monsoon climate and the fertility of the alluvial soil are the contributory factors. The three basins of the Hwang-ho, Yang-tse-kiang and Si-kiang are very important for cultivation. Millets and wheat are raised in Hopei, Shansi, Shuntung and Honan districts which are watered by the Hwang-ho. Rice is cultivated more or less throughout the country. The entire basin of the Yang-tse-kiang from Anhwei to the outer part of Szechewan grows rice. The average yield of rice per acre in China is 1,900 lbs. The reasons why the yield in China is great include the fertility of the soil, the use of manures and the diligence of the cultivator. Cotton is grown extensively in the Yangtse and the Yellow river valleys. She ranks third after U.S.A. and India in the production of cotton. In 1950, China produced 3·1 million bales of cotton. The tobacco crop in 1949 was estimated at 140 million lbs. Kiangsi and Fukien in the south-east coast are noted for tea. Tobacco is grown in most of the districts and there is a considerable export as well as a big home consumption. Silk, poppies, soyabeans and sugar-cane are also found.

The Government is adopting methods to increase production of agricultural commodities particularly food grains, as China is deficient in food-grains. In 1946-47, China produced 22 million metric tons of wheat and 48 million metric tons of rice, while her requirements are for over 24 million metric tons of wheat and 51 million metric tons of rice. Recently the Government has introduced a scheme under which it is possible for farmers to obtain financial help from the Government to carry on improvements on their lands.

Horses and mules are used as pack animals in the drier north. Cattle are reared throughout the country, while sheep are numerous in the north and the west. Swine is domesticated in Szechewan in the west, Anhwei, Shuntung and Hopei in the north-east and Kwantung in the south-east.

The mineral wealth of China is considerable. The most important region for minerals lies between Szechewan and Yunnan where almost every mineral is found. It is estimated that the country's deposits of coal would exceed those of any other country of the world except those of the U.S.A.* The annual coal production in China proper is about 22 million tons. Before 1939, about half of China's total coal production was controlled by foreign capital. The largest single coal producer is north-east Hopei with an annual output of 6 million tons. Large deposits of coal are found in the following areas: (1) the mountains of Shuntung, (2) the province of Shanshi, (3) Szechewan, and (4) Yunnan. There are also many other small coal-fields scattered throughout the country. *China dominates the world market in*

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* Her coal reserves total approximately 240 billion tons or about 1/7 of the U.S.A.

tungsten which is an important alloy in the manufacture of steel and for the filaments of electric lights. In 1948 China supplied 12,200 metric tons out of the world's output of 32,000 metric tons. The ores are found in Kiangsi, Hunan and Kwantung. Germany is the leading buyer of Chinese tungsten. *Iron deposits are found* in many provinces but the quantities are limited and of poor quality. China is distinctly deficient in iron ore reserves. The Yangtse valley from Kiangsu through Anhei to Hupei is the principal iron-ore zone. *In antimony, China has almost a world monopoly.* Antimony is useful as a hardening agent for lead and enters into the composition of type metal and anti-friction metal. Hunan is the leading producer of antimony. Small quantities of this ore are also found in Kwantung, Yunnan, Kiangsi and Kweichow. In 1948 the output of antimony was 3,251 metric tons. *Tin is also a valuable metal in China.* South-western China borders the great tin zone of the world which extends from Burma through the Malaya States to Indonesia. China's tin mostly comes from the Kochiu district in southern Yunnan, eastern Kiangsi and Hunan. In 1947 China proper produced 1,279 metric tons of tin. The bulk of the ore is shipped to Hongkong and Haiphong for refining. The other minerals found in China are gold, copper, asbestos, gypsum and graphite.

The development of mining is greatly hampered by the disadvantageous location of the chief mineral areas. As they are mostly situated in the interior, the distance is considerable from the ports, and transport facilities are very poor. Iron ore is not generally found near the coal-fields, a factor which is responsible for the slow development of the metal industry.

The manufactures, which are little developed, are mainly engaged for the supply of domestic necessities and are produced under old methods. Silk, cotton piece-goods, woollen goods, cigarettes, vegetable oil, porcelain and lacquered wares are the products of the manufacturing industries. Recently the iron and steel industry have engaged the attention of the people. At Shanghai a ship-building yard has been opened.

As the major portion of China consists of table-lands and mountainous districts, communications by road, rail and rivers are difficult. *There are about only 10,000 miles of railways in* *operation.* There are numerous roads over which a vast internal trade is carried on.

The total highway mileage in 1948 was about 81,000 miles. The important highways of commercial significance are the Szechewan-Hunan, Hanchung-Paiho, Szechewan-Yunnan, Lashan-Sichang and Sichang-Hsiangun.

The rivers of China are important both for irrigation and navigation. The chief rivers are the Yang-tse-kiang, Si-kiang, Hwangho and the Pei-ho. The Yang-tse-kiang provides an excellent waterway for more than 1,000 miles from its mouth. The Yang-tse-kiang is the main channel of trade, industry and the only means of communication with Central China. It has opened up an enormous tract of territory to foreign commerce. The Hwang-ho or Yellow River in North China is the second largest river of the country. Its disastrous floods have cost millions of lives and enormous wealth in China. From its source to the sea it is 2,700 miles long, and yet the river is not navigable. The course is either too swift and broken by rapids or becomes too shallow and filled with too many sandbars to allow the use of boats. Only in part of Hunan and for 25 miles above the mouth is the river navigable for steam launches. The Si-kiang in southern China rises in the highlands of Yunnan and flows eastward. The Si-kiang is navigable throughout its course.

River-basins	Climate	Relief features	Products
Hwang-Ho (N. China)	Temperate Monsoon, winters dry and cold—summers hot and rainy.	(*a*) Wei-ho valley (*b*) Loess plain (*c*) Flood plain	Wheat, millets, barley, soya-beans.
Yang-Tse-Kiang (C. China)	Sub-Tropical Monsoon. Rain at all seasons.	(*a*) Red basin (*b*) Ichang gorge (*c*) Central plain (*d*) Delta	Rice, tea, cotton, silk, coal, iron.
Si-Kiang (S. China)	Tropical Monsoon. Hot and wet at all seasons.	(*a*) High Yunnan plateau in west. (*b*) Delta	Rice, cotton, silk.

These three river basins of China form distinct natural regions as regards relief, soil, climate and products.

Estimates of the population of China vary considerably, as no census has ever been taken, but the latest report places it

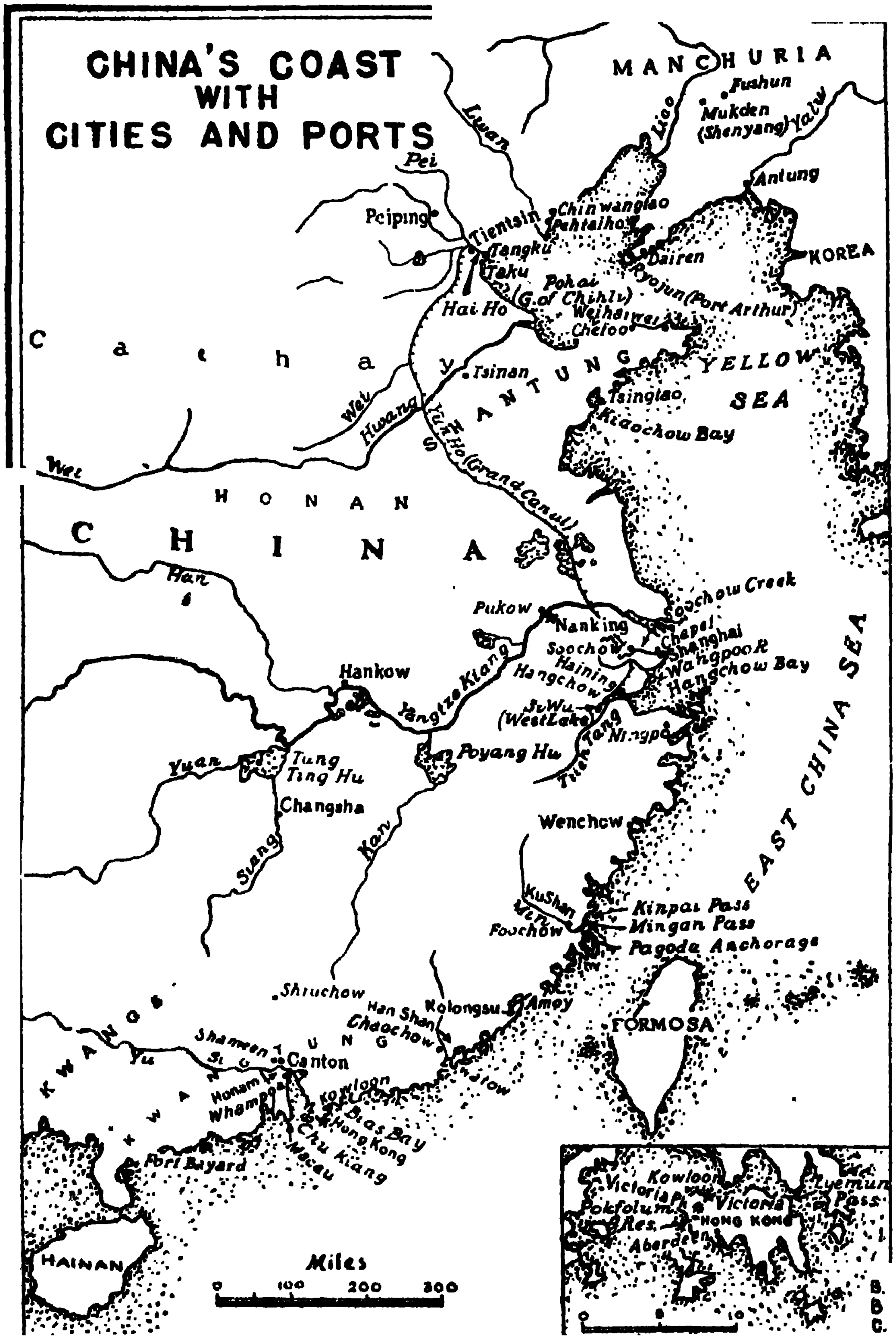

FIG. No. 78. China has a fairly indented coastline which accounts for a large number of ports. All her imporant cities are either ports or on the river basins.

at about 459 million inclusive of the inhabitants of Tibet, Mongolia as also overseas Chinese.

The distribution of population in China is very unequal. Density of population is very high in (*a*) the coastal plain from the Manchurian border in the north to the island of Hai-nan in the south ; (*b*) the plains watered by Hwang-hò, Yang-tse-kiang and the Si-kiang ; (*c*) the Wei-ho valley and the Red Basin of Szechewan. The alluvial soil, adequate rainfall and high summer temperature favour the cultivation of lands in all these regions. It must be noted that the very large population in China depends entirely on agriculture. The lower basins of the three great rivers have an average density of population of more than 500 per sq. mile. The areas of low density of population are Tibet, Sin-kiang and Mongolia which are desert-plateaus where the density is nowhere more than 16 people per square mile. The Yunnan, although a plateau, is crossed by numerous fertile valleys and contains rich minerals. The region is, therefore, densely populated.

China's share in the world trade is scanty. Silk, bean products, cotton, tea and coal comprise the bulk of China's contribution to world trade. The chief role of China is to furnish raw materials. The other exports are tin, sugar, hides, pottery and bamboo wares. The principal imports are cotton goods, hardware, machinery, ship-building materials, arms and ammunition, matches and opium. The development of trade in China has only begun, and the possibilities are great.

PORTS AND TRADE CENTRES

The important ports of China are Tientsin, Shanghai, Hangchow, Canton, Nanking, Hankow and Fuchow.

Shanghai is the most important port in China, handling as it does in normal times over 50 per cent. of China's foreign trade. Shanghai is situated on a tidal creek near the Yang-tse-kiang. Its manufacturing industries are cotton and silk. It is the principal port of modern China, and is the natural outlet of the Yang-tse-kiang.* Its situation approximately midway along the China Coast makes it at once the most natural distributing centre for extensive trade with coastal ports: but of far greater importance is the fact that Shanghai commands the vital position for commerce and the very outlet of the whole Yangtse river system. The harbour is not very deep and, therefore, big steamers have to anchor at some distance from the shore. *Hankow* is situated at the confluence of the Yangtse-kiang and the Han rivers. It is an important river port and manufactures cotton, silk and steel. *Tientsin* is the port for Peiping and is the main outlet for the produce of northern China. *Nanking* manufactures silk and cotton.

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* Shanghai is not actually on the Yangtse. It is located, instead, some 13 miles up the Whangpoo, a tributary of the Yangtse.

Hongkong, a British possession, is an island port near the mouth of the Si-kiang in southern China. It has an excellent harbour. *Victoria* is the town of the island. It is the main outlet for the produce of Southern China. Hongkong is a free port, and carries on a large entrepot trade with Australia, India and the United Kingdom.

Manchukuo

Manchukuo, formerly known as Manchuria, is formally an independent State ; but it lies within the sphere of Japan's economic influence. The State lies to the east of the Mongolian Highland and covers an area of about 460,000 square miles. The country is generally plain and is drained in the north by the Amur. Although agriculture is the mainstay of the people, the cultivated land constitutes only 14 p.c. of the total area, the remaining lands being forests, pastures and wastes. The principal agricultural crops are soyabeans, millets, wheat, maize, barley and rice. Soyabeans cover one-fourth of the cultivated land and supply 50 p.c. of the world output. Manchukuo is known as the "Soya-bean Empire of the world". Soyabean is the most important product. It is converted into sauce or into a kind of confectionery or is used as a table vegetable. The oil which is extracted from it is used in the manufacture of water-proof, umbrella, varnish, ink and soap.

The State has considerable mineral wealth. Gold, coal and iron are being worked gradually. The agricultural and mining resources have caused a rapid development of manufacturing industries—specially in the southern side. The industries are mostly run by the Japanese.

The want of adequate means of communication is still hindering the progress of the country. Roads are muddy and badly made. The extension of railways will bring about a rapid progress in the State. *Mukden* is the capital of the country. It is connected with Tientsin and Port Arthur. The two principal ports are *Newchwang* and *Darien.*

Manchukuo has a strategic location of political and economic importance. It has a large area to accommodate further population ; it is very productive from the point of view of soil and mineral resources ; and its climate is favourable to human activities. She has rightly been called a "prize of the Far East". The three adjacent countries, China, Japan and U.S.S.R., are very much interested in Manchukuo. The U.S.S.R. can use its ice-free ports ; China's surplus population can settle here as the population in Manchukuo is yet sparse.

Japan is also vitally interested in Manchukuo which would act as a first line of defence in case a war broke out between Japan and Russia. The vast agricultural, pastoral and mining resources of Manchukuo can provide Japan with raw materials for her industries. In Japan population is increasing fast and the country is feeling the pressure already. The surplus population can migrate to Manchukuo. Further, Manchukuo would be a good market for Japanese goods.

QUESTIONS

1 Show by reference to climate, natural vegetation and mineral resources, why Manchukuo has such important economic possibilities for countries like Russia, Japan and China.
(I. I. B. 1930; Cal. Inter. 1934).

2. Estimate and locate the mineral wealth of China. What are the present difficulties for the development of mining in China?
(Cal. Inter. 1942; Cal. B. Com. 1933; Delhi Univ. B.A. Hons. 1950).

3. Give a reasoned account of the economic geography of Manchukuo. (Indian I. Bankers, 1940).

4. Discuss the position of China as a supplier of industrial raw materials. How is the conquest of China likely to help Japan in its bid for commercial supremacy in the world? (Cal. B.A. Hons. 1941).

The Philippines, Indo-China and Indonesia

The Malaya Peninsula, Thailand and Indo-China enjoy the monsoon type of climate ; Indonesia and some parts of Malaya Peninsula have equatorial type of climate.

· The Philippines

The Republic of Philippines came into existence in July 1946. Prior to this it was a U.S.A. dependency.

The total area of the country is 115,000 square miles with a population a little above 13 million. The majority of population is concentrated in Luzon, the islands of Cebu and Bohol and parts of Panay and Negros. The under-populated islands are Mindanao, Palawan, Mindoro, Basilan ánd Samar. *Thus the problem of population in the Philippines is one of maldistribution rather than of over-population.* The problem can be solved by encouraging migration of population from the over-populated regions to the undeveloped but potentially rich island of Mindanao. Area of land under cultivation is about 14 p.c. of the total land area. 3·5 million people depend directly on agriculture. The chief crops are rice, sugar-cane, maize, cocoanuts, abaca* and tobacco. Rice is the staple cereal food of the Fillipinos. But the country is not self-sufficient in foodstuff. In 1938, the government established the National Rice and Corn Corporation to import rice from neighbouring countries. During the Japanese occupation of the Islands, the production of corn, cassava and sweet potatoes was encouraged to lessen dependence upon imported foodstuffs. Nearly 60 per cent. of the crop acreage is devoted to rice and maize.

PRINCIPAL CROP-PRODUCTION (1948-49)

(In metric tons)

Rice	2,491,290	Cocoanuts	998,478
Corn	534,070	Tobacco	21,920
Copra	698,120	Cocoanut oil ..	102,300
Sugar-cane ..	692,910	Abaca	74,510

Sugar is raised for export. In normal time, sugar accounts for well over a third of the total value of all Philippines export. The annual production of sugar is about 1 million tons while the home consumption does not exceed 115,000 tons, leaving a considerable surplus for export.

* Abaca, a species of plantain which yields a valuable fibre, the so-called *Manila hemp* of commerce. It is like the banana in habit of growth. The leaf stalks are split into long stripes beaten with clubs, hackled, washed and dried.

The country is normally the world's leading exporter of cocoanut products and supports 4 million people.

Abaca (known as Manila hemp) is produced to the extent of about 200,000 metric tons mainly for export to U.S.A. (40%), U.K. (25%) and Japan.

Tobacco has become an important Philippines export. About 600,000 people are dependent on it. 88 p.c. of the tobacco goes to the U.S.A. in the form of cigars. The Japanese encouraged production of tobacco for cigarettes.

Mineral resources. Of late, mining has become very important. Gold production has made great progress during the last ten years. The principal base metals are iron ore, chrome and manganese ores and copper. The total of base metals in 1940 amounted to about 1,500,000 tons. The country lacks oil and coal.

There is little industrial development in the Philippines. Manufactured goods consist of cigar, cordage, pearl button, embroideries, canned pineapple and hats.

The most important items of export from the country are sugar, hemp, cocoanut oil, copra, tobacco, embroidery and timber.

The most important items of import into the Philippines are cotton goods, iron and steel goods, vehicles, silk goods, paper, food, cigarettes, petroleum, chemicals and pharmaceutical products, explosives and fertilizers and machines of transport. Cotton goods, iron and steel and food products form the bulk of imports. The direction of trade is mostly with the U.S.A. (export 75% and import 62%).

Thailand (Siam)

The area of the country is just under 200,000 square miles, which is rather less than that of Burma. The population consists of about 15,000,000 souls. The population is mostly confined to the alluvial plains and river valleys, where the cultivation of rice is possible. The alluvial plains of the Menam and Mekong rivers in middle Thailand are the most populated parts of the country. North Thailand has only a scant population. Most of the people of the country belong to the *Thai* who came from Yunnan. About 2½ million people are Chinese and are found in mines and plantations. The central plain which is drained by the Menam is the most productive part of the country. The upper Siam consists of a series of hill ranges.

About 70 per cent. of the land is covered by forests. In the north, mixed deciduous forests with teak predominate. In all other parts of the country, tropical evergreen forests are found. The British control about 45 per cent. of the teak trade of the country. The cultivated area occupies about 10 per cent. of the total land area. 83 p.c. of the population are engaged in agriculture. The chief produce is rice. Other products are cocoanut, tobacco, pepper, cotton and rubber. As rice accounts for 94 per cent. of the cropped area, the question of irrigation is very important. Only limited sections of Thailand receive adequate rainfall (70″) for rice cultivation. Canals and ditches have been constructed to direct flood-waters to fields. In 1950-51, Thailand had produced 6·6 million metric tons of rice. There is a plan to bring 2 million acres of land in the central plain under rice cultivation. The minerals are varied—but little developed except tin-mining. The country has deposits of wolfram, antimony, coal, copper, gold, iron, manganese, molybdenum, rubies, silver, zinc and zircon. By far the most important are tin and wolfram.

MINERAL PRODUCTION (1949)

Gold	287,844	(Fine ounces)
Silver	150,760	(Fine ounces)
Chromite	246,744	tons
Copper	7,007	tons
Iron ore	370,172	tons
Manganese ore	26,288	tons

The country possesses no industries of importance, but the government has lately set up a paper factory, two sugar factories and a factory for the weaving of cotton cloth.

The principal exports are rice, tin, rubber and teak. India imports rice and teak. Thailand exported 1·2 million metric tons of rice in 1949.

The imports are textiles, metal manufactures and machinery. Among Indian exports to Thailand gunny bags are by far the most important followed by cotton yarn and textile manufactures and opium.

Japan was the principal supplier of textile goods to Thailand. Now that Japan's monopoly has gone, India can enter into trade agreements for import of rice in return for textile goods.

But the Government must gain control over the industry from the hands of foreigners (British and Australian in the mines, British in teak and Chinese in rice mills).

The Government is endeavouring to supplement the cultivation of rice by encouraging the planting of cotton, tobacco and soyabeans.

Bangkok on the river Menam is the capital and only port of Thailand. Many canals run through Bangkok and, therefore, it is known as "the Venice of the East". It has a population of about 1 million inhabitants.

Malaya

Malaya comprises three political divisions and is a British sphere of influence: (*i*) *Straits settlements,* (*ii*) *Federated Malaya States,* (*iii*) *Native States.* The geographical location of Malaya half way between India and China made it an object of intense rivalry among the European nations engaged in Far Eastern Trade during the 19th century.

Only two-fifths of Malaya's 53,000 square miles are inhabited and the remaining three-fifths are primeval evergreen forests. The total population of Malaya in 1939 was 5·3 million. There are certain remarkable features in the distribution and composition of population. The greater part of the population is confined to the western section with an average width of about 40 miles, and stretching along the whole peninsula. This region is important for mining and plantation. The eastern part of the peninsula is very scantily populated as the area is forest-covered. Of the total population of Malaya, Malayans account for only 45 per cent. and the rest are the Chinese, Indians and Europeans. The Chinese form 39 per cent. and the Indians, 14 per cent.

The mineral wealth of Malaya lies mainly in tin, of which Malaya is the world's greatest individual producer, her output sometimes approaching 40 per cent. of the world's production. The export duty of tin is always a major source of Malayan revenue. Bauxite, wolfram, iron and manganese ores and phosphate of lime, kaolin, coal, gold and arsenical ores are also found in varying quantities. Tungsten ore averaging 1,373 tons annually comes mainly from a large deposit of Scheelite at Kramat Pulai in Parek. Wolfram ore is mined in Kedah and Krengganu. Coal deposits are found in Selangar.

The major crops of Malaya are rubber, cocoanut, rice, oil palms and pineapples while coffee, tea, tobacco, banana and tapioca are less important. About 65 per cent. of the total area is under rubber plantation. Rice covers 14 per cent. of the crop area and is grown exclusively for home consumption. Rice production of Malaya is, however, insufficient for the country's needs.

The principal items of exports are rubber, tin, copra and tinned pineapples. Tin and rubber constitute 60 per cent. of exports. India's share is only 3 per cent. of the total exports. India imports canes, gums and resins, dyeing and tanning substances. Malaya imports rice, sugar, milk, tobacco, iron and steel, vehicles, machinery and petroleum. Sixty per cent. of rice and almost all milk required are imported. India supplies coal and coke, cotton goods, grain, hides and skin. jute goods, etc.

Capital controlling rubber and tin is British, the remainder being mostly Chinese. Malaya is not an industrial country. Apart from tin smelting, local industry is small and confined to pineapple canning, brewing, the manufacture of rubber articles, soap, matches, cigars, biscuits and ice.

The future economy of Malaya depends on two factors: first, a continued world demand for her rubber, secondly, success in gradually establishing an economic structure which does not depend heavily upon the production of commodities liable to sharp fluctuation in price.

As regards rubber, the future is uncertain because of the introduction of synthetic rubber in U.S.A., the greatest buyer. "The problem is to induce producers to balance the immediately lucrative occupation of rubber production with other necessary forms of production."

Singapore with a population of 500,000 is one of the most important sea-ports in the Far East. It has a great entrepot trade. Rubber, tin and copra are collected from Malaya and exported to the U.S.A., the U.K. and Japan. It also exports pineapples, spices and iron-ore.

Indo-China*

Indo-China has an area of 286,000 square miles and a population of about 23·8 million. The population problem is one of maldistribution ; the lowlands are greatly agglomerated while the uplands and mountainous regions are very thinly settled. About 78 per cent. of the population occupies 13 per cent. of the total areas. But all alluvial lowlands are not equally populated and developed. The alluvial lowlands of the Red River have high densities while the alluvial plains of Cambodia have low densities and production. This difference arises from the fact that Annamites of the Red River lowlands are the most intelligent element of population of Indo-China and are hard-working whereas Cambodians and Laotians are indifferent farmers.† Agriculture plays an overwhelming part in the economy of the country. Rice is the most important crop, the yearly production averaging 7 million tons of which 1·5 million tons are available for export. Maize comes next with a surplus for export. Other crops are oilseed plants, cocoanuts, pepper, and rubber. About 300,000 tons of fish are caught of which one-tenth is exported. Animal husbandry is not important in the economic life of Indo-China. Cattle are used for ploughing and not for milk and meat. The lack of suitable pasture in the densely settled lowlands is a handicap to live-stock industry.

The country is rich in minerals but the development of mining is slow and meagre. Coal, tin, zinc, wolfram, lead, silver, antimony, chrome, iron, phosphates, tungsten, manganese, bauxite, graphite, copper and rock salt are the principal deposits.

The manufactured articles are alcohol from rice, sugar, cement, cigarettes, soap and matches.

The principal exports are rice, rubber, maize, coal, fish, tin ore, cement, sugar, pepper, beer, cigarettes, chromium, manganese and sodium chloride. The imports are ginned cotton, cotton tissues, iron and steel, paper and paper manufactures, silk tissues, machines and machinery, motor cars and parts, coal, potatoes, etc. India imports rice and exports raw cotton, jute manufactures, and opium.

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* *Viet Nam* is that area of Indo-China where majority of the people are not of Annamite race. The Republic came into being early in 1945.

† Labour conditions in Indo-China (International Labour Office, Geneva, 1938).

Hanoi, with a population of 129,000 is the capital. *Saigon* and *Phan-Rang* are the chief ports.

Indonesia

Before the World War II, Indonesia was known as the Netherlands East Indies. In 1945, the Indonesians set up a Republican Government in Java, Madura and Sumatra. The Dutch Government has now recognised the sovereignty of the Indonesian Republic.

The United States of Indonesia was formally inaugurated in January, 1950. It has an area of 735,000 square miles with 78 million population (1950). Indonesia consists of Java, Madura, Sumatra, Borneo and several other small islands extending more than 3000 miles from east to west.

Sugar-cane, rubber, copra, tea, tobacco, coffee, Manila-hemp and timber are the principal products. Oil-fields in Borneo, Celebes, Sarawak and Java have recently become very important and these supply nearly 3 per cent. of the world production. Palembang in Sumatra and Tarakan in north-east Borneo are the two important oil centres. The production of crude petroleum in 1950 was 5·4 million metric tons. Coal production is insignificant. Indonesia supplies 18 per cent. of the world's tin. Nearly ⅔ of the output is from the island of Banka and ⅓ from Belliton. In 1950 Indonesia raised 33,000 metric tons of tin of which 31,000 tons were exported.

Java is by far the most developed island in Indonesia and it can boast of a highly organised sugar industry in the East. The important trade centres are Batavia and Surabaya. *Jakarta* (Batavia) is the capital and possesses a magnificent harbour.

I. AREA, POPULATION AND DENSITY OF INDONESIA

Names of islands	Area	Population	Density per sq. mile
Java and Madura ...	51,035	41,718,364	818
Sumatra ...	182,867	8,254,843	78
Borneo ...	208,295	2,168,661	...
Other Islands ...	290,804	18,343,494	6
Indonesia ...	735,000	73,845,362	82·6

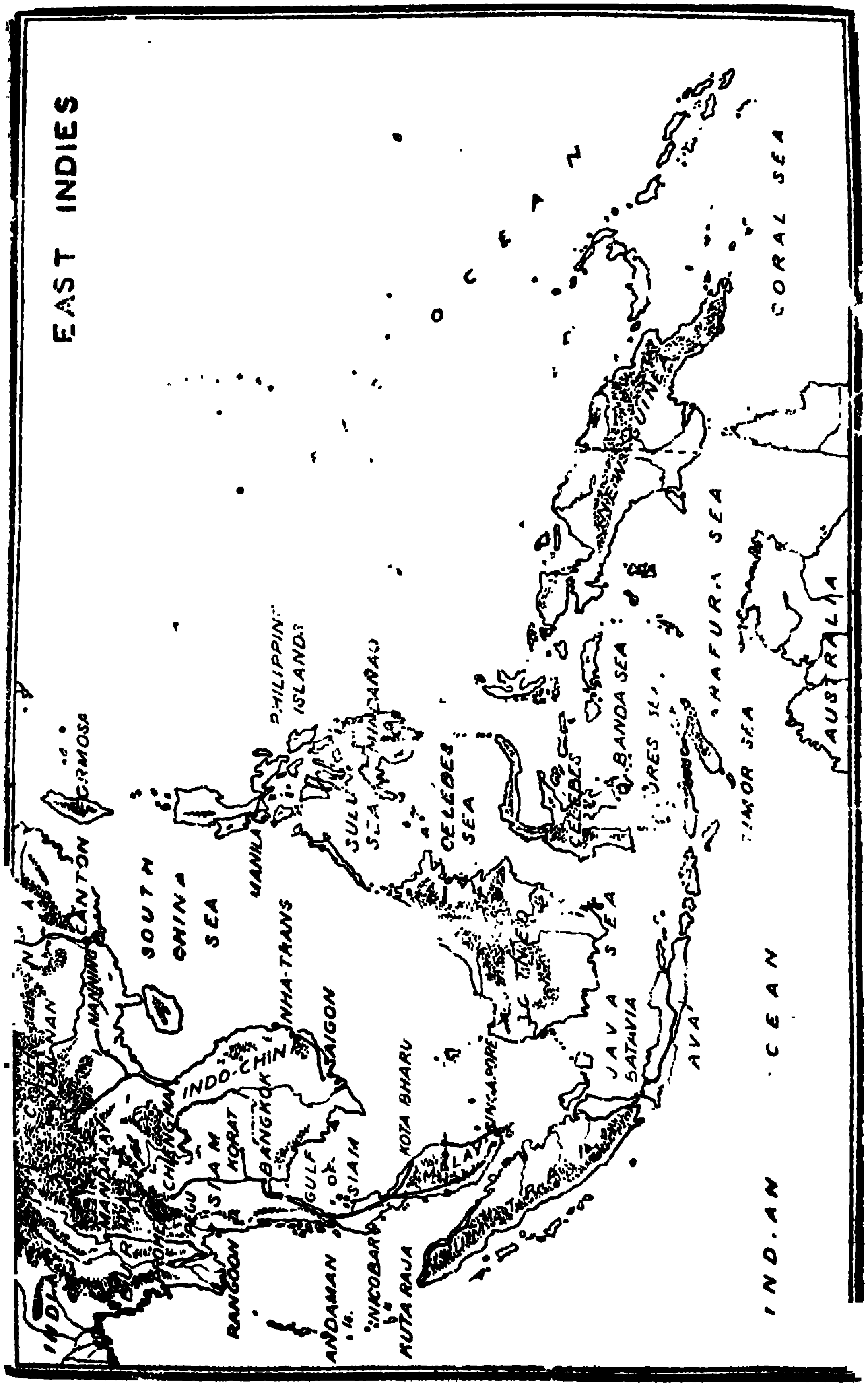

FIG. No. 79. The East Indies, now known as the United States of Indonesia, runs for about 3,000 miles from east to west.

The composition of population in Indonesia is of great interest. About 97·4 per cent. of the population are Indonesians while Europeans and Chinese represent only 2·5 per cent. About 80 per cent. of the Europeans live in Java and of the rest more than half live in Sumatra.

II. COMPOSITION OF THE POPULATION

Names of islands	Europeans	Chinese	Other Asiatics	Indonesians
Java and Madura ...	197,571	582,431	52,269	40,891,093
Other Island ...	47,846	650,783	63,266	18,246,974

There are two types of farming in Indonesia: *agriculture* and *plantation*. *Agriculture* is in the hands of the Indonesians, and the peasants are concerned with the production of food crops for domestic consumption. Rice is the leading crop of the people and occupies 45 per cent. of the crop area, with maize 23 p.c., root crops 14 p.c., pulses 9 p.c. and tobacco 2 p.c. *Plantation agriculture* has been developed by the Dutch. The principal crops are rubber, sugarcane, coffee, tea, oil palms, cinchona and tobacco. The importance of Indonesia as a producer country can be best judged from its share in the value of total exports of the world.

III. SHARE OF INDONESIA IN THE EXPORTS OF IMPORTANT COMMODITIES IN THE WORLD MARKET

(Given as a percentage of Total World Trade).

Name of the article	1929	1939
Cinchona bark	91	72
Kapok	73	72
Pepper	69	86
Rubber	30	37
Cocoanut products	29	27
Sisal	22	38
Tea	17	19
Cane Sugar	11	6
Coffee	6	5
Palm oil products	5	24
Petrol	3	8
Tin	18	17
Bauxite	0	7

IV. DIRECTION OF TRADE IN 1950

	Imports	Exports
U. S. A.	315,863	446,669
Holland	262,332	665,159
U.K.	112,158	99,261
Japan	160,210	38,254
Singapore	69,617	914,840
India and Pakistan ...	83,606	10,980
TOTAL ...	1,526,797	2,741,741

V. COMPOSITION OF TRADE: EXPORTS

Year	Total Exports (000 rupiah)	Percentage of agricultural products	Percentage of forests and other products	Minin
1938 ...	787,000	64·7	25·7	30·9
1948 ...	1,040,000	67·9	...	28·9
1951 ...	4,663,800	...	...	...

The Near and the Middle East

Turkey, Syria, Iraq, Arabia, Afghanistan, Iran and Palestine are popularly known as the *land of the five seas.* This part of Western Asia is washed by the Caspian Sea, the Black Sea, the Red Sea, the Mediterranean Sea and the Persian Gulf. Economically, Arabia, Iran and Afghanistan are important. Most of the Middle East countries are poor in natural resources. Any large scale industrial development in them will take a long time to come. These countries will remain importers of consumer goods from the West and the East. For limited industrial development, they may also import capital goods for agricultural, hydro-electric and irrigation development.

Syria covers approximately 60,000 square miles of land. It constitutes the home of nearly 3 million people. Agriculture is the chief source of wealth. Fruits, grapes, wheat, cotton and barley are grown in the western part of the country where the climate is Mediterranean.* The central and eastern parts provide pasturage for live-stock. There is a good trans-desert road between Damascus and Baghdad, and an excellent network of roads connects Beirut with Damascus and Tripoli as well as with numerous hill stations of Lebanon. The Republic is making steady progress in industrial development. A number of small woollen and cotton textile mills are now in existence. Notable progress has also been made in cement, soap, silk, matches, cigarettes and canned fruit industries. The country is not rich in minenals, but there are indications of petroleum in various places and iron ore, lead, copper and other minerals are known to exist. There is plenty of marble and good building stone. *Tripoli, Beirut* and *Saida* are the principal ports. *Aleppo* and *Damascus* are historically important.

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* There is a small exportable surplus of wheat and barley which India might find worth while to purchase if satisfactory prices could be negotiated. *Vide* Report of the Indian Trade Delegation to the Middle East, 1947.

Iran comprises an area of more than 600,000 square miles with a population of nearly 15 million. Its location at the border of the Soviet Union has invested it with political importance. Iran offers a road of approach to the open sea

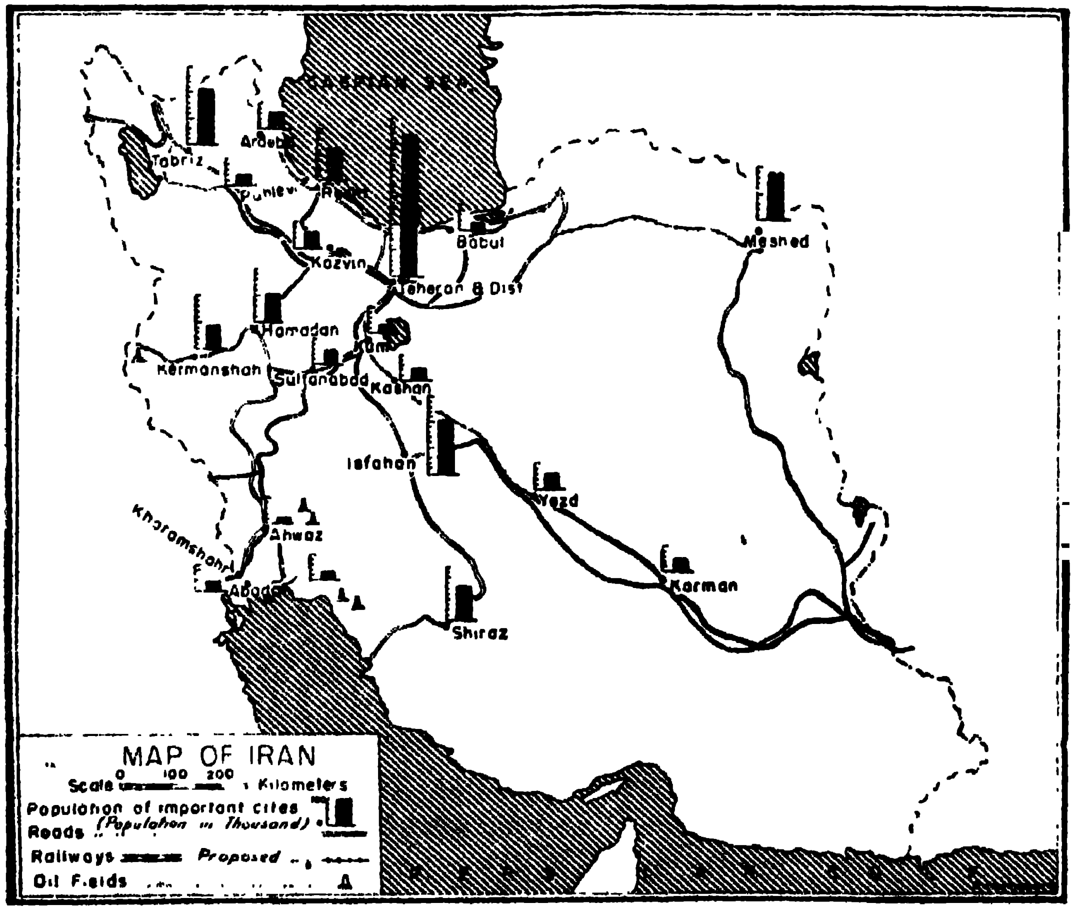

FIG. No. 80.

from the point of view of Russia. The interior is mountainous. In the central and eastern parts of the country desert conditions prevail, but the south-west and some northern parts are fertile and produce garden crops, wheat, rice, cotton and tobacco with the help of irrigation. Iran possesses every type of climate from the extremes of tropical heat near the shores of the Persian Gulf to extreme cold in the high regions of the Elburz mountains. Climatically the country can be divided into three parts: (*a*) The Caspian sea region, (*b*) the Central plateau and (*c*) the Persian sea region. The winter is very cold in the central plateau. The relief and availability of water in Iran control the distribution of population. About 2 million people live in large cities ; a little above 2 million are semi-nomadic and the others live in villages scattered among the basins along the lower portions of mountain slopes where they can get water or find forage for their livestock. The Caspian provinces of Gilan and Mazandeam have the highest density of population with 100 persons per square mile. Iran contains petroleum, coal and iron. With the exception of petroleum, minerals are not worked. The petroleum fields are on the south-western part of the country in an area of about 25 square miles.* The oil-fields are connected by a double pipe-line, 145 miles long, running through Dar-I-Khazina and Ahwaz to refineries at Abadan. Iran is the fourth largest petroleum-producing country in the world.

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* In Iran, the Anglo-Iranian Company's fields, north west of Abadan produced 17,000,000 tons of oil in 1945. Oil is refined at Abadan and exported in tankers. It often experiences labour troubles with its native staff, owing to rising costs of living in Persia and labour agitations. Farther south, on the Persian Gulf, the oil field of Bahrein has now reached its peak and is beginning to decline. The British Government has great interest in the Anglo-Iranian Company as it controls 52·55 per cent. of the shares. The oil company employs about 75,000 people. But, on the coast opposite the island of Bahrein, the new oil-field of Dhahran is coming into production. The oil is refined at a new refinery at Res Tanura.

The Kowait oil-field, which lies 30 miles south of Kowait on the Persian Gulf, is now in production and pipes have been laid out into the sea from which tankers will be filled.

The Iran Government initiated the policy of petroleum nationalisation in March, 1951. Implementation of the policy was followed by a stoppage of oil exports in June, 1951 and the shutdown of the oil-fields and of the Abadan refinery in August, 1951.

The shutdown of the petroleum industry has brought in several problems like stoppage of oil revenue and foreign exchange receipts and unemployment of petroleum workers.

About one-twelfth of the land is under cultivation and the principal crops are wheat, barley, rice and cotton. Tea, sugarcane and tobacco are also raised. The Government has plans for irrigation development and it is expected that the country

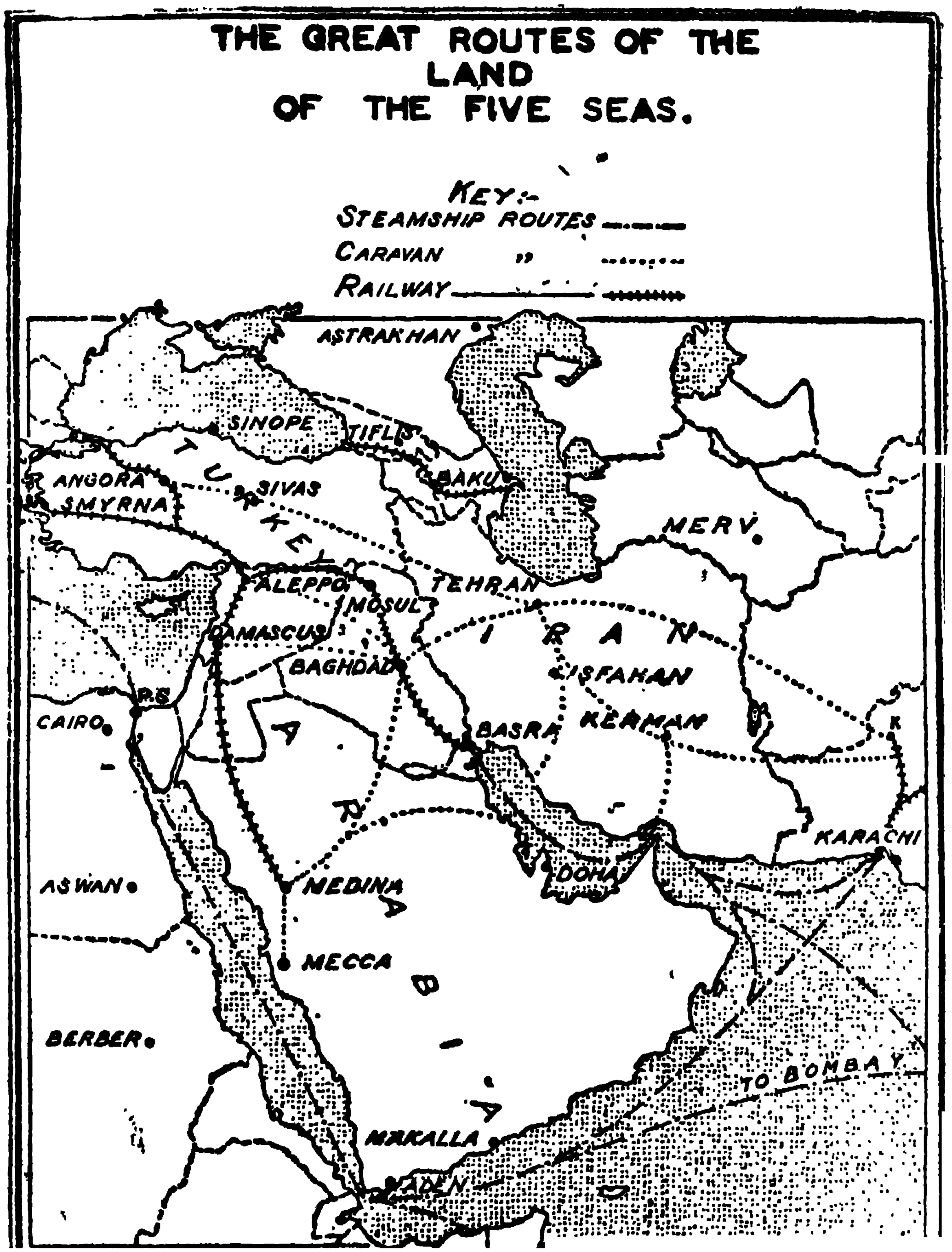

FIG. No. 81. Communications in the Middle East.

will be able to produce more. Locust prevention is receiving extensive research and plant diseases are being studied.

Iran has developed various industries on modern lines. Large sugar factories are located in Karaj, Kahrizak, and Shahabad. Cotton mills are in Sahi, Tabriz, Teheran and Yezd ; woollen mills are at Tabriz and Isphahan ; and silk factories are at Chalus. The other industries are cigarette-making, soap-making, fruit-canning, glass-making and tanneries.

Want of adequate means of communication is a great handicap. *The only important rail-road is the one which connects the Caspian Sea coast with the Persian Gulf area. The line passes through Teheran and played an important part for the transhipment of goods to U.S.S.R. during World War II.* Several branch lines are being constructed to connect Tabriz with Kazrin and Qum with Yezd. There is also a scheme for connecting Teheran with Zahidan (on Pakistan border) via Meshed. Thus in future it may be possible to have a through railway communication with India via Pakistan. *Roads* are very important in Iran. There are at present 15,000 miles of motorable roads on which much of the internal trade depends. The Government has its own *air services*. Excellent aerodromes exist in Teheran, Tabriz, Meshed and Isphahan.

The principal exports are petroleum, rugs, dried fruits, livestock, opium, wool, rice and gum. The imports are cotton cloth, sugar, tea and machinery. India takes from Iran rugs, silk, wool, gum, dried fruits and petrol. Iran takes from India tea, sugar and cloth.

TRADE CENTRES AND PORTS

Teheran lies almost at the foot of the Elburz mountains. Though situated in the midst of an arid steppe, Teheran has been the political centre of the country since 1788. It has about 600,000 population. The city is famous for artistic fabrics like carpets and rugs and also wine, etc. *Shiraz* is situated at an elevation of 4,500 feet above sea level and 120 miles east of the Persian Gulf. It is famous for its excellent wine, rose-water and attar of roses. *Tabriz* lies to the north-west frontier of the country, at an elevation of 5,000 feet above sea level. It has 300,000 population. It is the principal trade centre of the kingdom. The neighbourhood is very fertile, producing large quantities of grapes and fruits. Both *Bandar Abbas* and *Bushire* are noteworthy ports on the Persian Gulf. The climatic conditions are excellent for aviation as there are no fogs and high winds. These two ports do considerable trade with India and the neighbouring State of Pakistan.

Palestine :—This region was a mandatory State under British control and has an area of 9,000 square miles with a population of a million and a half. The coast of Palestine is narrow and fertile and has the Mediterranean type of climate. The coastal plain is the main centre of the new Jewish colonies. The limestone highlands cover the central region, and in the farther east there is the deep rift valley of the Jordan and the Dead Sea.

The principal occupation of the people is agriculture. Wheat, barley, oranges, grapes, figs, and tobacco are the chief crops. Oranges are the most important fruit crop and the principal export of Palestine. Both wine grapes and table grapes are raised for the local markets as well as for export to the neighbouring countries.

The mineral resources of the country are as yet undeveloped. The Dead Sea contains unlimited quantities of potash, bromine, magnesium and chlorides. Other minerals known to exist in Palestine are salt, phosphates, gypsum, manganese, copper, sulphur and petroleum.

There is a small fishing industry but the export is negligible. Livestock consists of cattle, sheep, goats, donkeys, horses and camels.

State of Israel :—In May 1948, Palestine was partitioned and a separate state for the Jews was created. The Jewish State is known as *State of Israel* and includes the entire coast from Galilee to the point of Gaza. It contains an area 8,000 square miles with 1·6 million population.* The population of the State is made up, to a considerable extent, of recent immigrants from Europe, particularly from Russia, Germany, Austria and Spain. They have already transformed the economic structure of the State by developing the natural resources, raising the productivity of agriculture and industry and introducing progressive means of production and distribution. The industrial experiments are being undertaken not by the State as in the other Middle East countries, but by private initiative and enterprise.

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* The population has grown rapidly, from 870,000 in 1949 to 1·6 million in 1951. Immigration has accounted for 174,000 in 1951.

The geographical divisions of Israel are (*a*) the plains, (*b*) the hills and (*c*) the Negeb. The plains consist of the Vale of Jezreel, Huleh and Jordon Valleys where fruits and grapes are extensively cultivated. The hills surround Gallilee and Samaria and are important for fruit-growing. The Negeb is as yet undeveloped.

Although the State is poor in coal, it has large deposits of other minerals like Potash and Bromine.

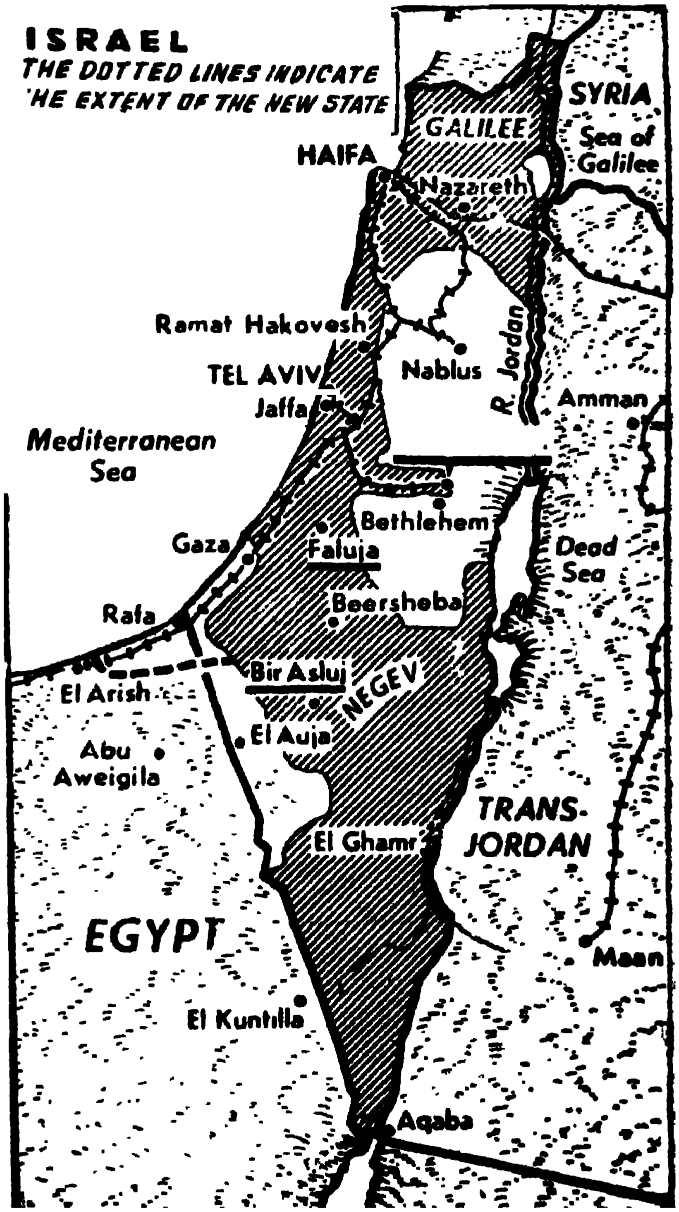

FIG. No. 82. The division of Palestine gives the Jews a new State comprising about 700 square miles of area. The Jewish sector was the motive power in the economic life of Palestine.

The State exports citrus crops, fruit concentrates, wine, potash, chemicals and porcelain teeth.

The increase in agricultural output has been achieved partly by bringing back into cultivation farms owned by Arabs who had left the country during the disturbances, farms which had been left untilled after the hostilities, and partly by increasing new land under cultivation and partly by increasing production.

In 1950 about 350,000 hectares of land were under cultivation both for rain-fed and irrigated crops. Important agricultural products are citrus fruits, vegetables, potatoes and grains. Israel is still dependent on imports for 85 p.c. of its bread cereals. The Development plan envisages an expansion of cultivated area to 500,000 hectares by 1953. In 1950 about 97,000 persons were employed in agriculture. Industrial output has increased during 1948-50. In 1950 about 107,000 persons were employed in manufacturing industry.

The important trade centres are *Jaffa, Haifa* and *Tel-Aviv*. Haifa is the natural outlet of the country ; it is a port as well as a railway centre.

OUTPUT OF INDUSTRIES

	1948	1950
Electricity (million of Kwt.) ..	261	464
Soap (metric tons)	2,600	9,200
Cigarettes ,, ...	1,063	1,561
Matches (Boxes, thousands of gross)	231	292
Beer (thousands of gallons) ..	17,972	12,288
Wine ,, ..	7,511	3,078

Soap-boiling is the principal industry, and soap, cereals and fruit form the chief exports.

Iraq :—The modern State of Iraq is a child of the first World War, and owes its progress largely to the efforts and devotion of its British officials. Iraq is situated between the Persian and the Arabian Highlands and has an area of 117,000 sq. miles. The greater part of the country consists of lowland which is drained by the Tigris and the Euphrates. The frontiers of Northern Iraq includes a portion of the Syrian Desert, and consequently the area is uncultivable and almost waterless. Population is a little over 4 million, of which 3 million are Muslim Arabs.

Cultivated lands form only 8 per cent. of the total area, but these support more than 8 per cent. of people. Barley, dates, tobacco, cotton and wheat are the principal crops. Agriculture is practised in the southern alluvial plain with the help of artificial irrigation. This area is drained by the Euphrates and the Tigris and is threaded and criss-crossed with water-channels. The southern part of the plain is always in danger of flood in the spring time when the snow melts on the mountains of Kurdistan and Anatolia. Dates have been and still are Iraq's most important agricultural product, and Iraq supplies about 80 per cent. of the world's trade in this commodity. The dates are produced mainly in the Basra area, are packed in boxes and are generally exported to Europe and the U.S.A. Except for sugar, tea and coffee, Iraq is more or less self-sufficient in essential foodstuffs.

With improved agricultural methods, extended irrigation, more capital, and better communications, Iraq would be able to support a population many times its present size.

Iraq is not highly industrialised but there are a number of factories of textiles, soap, vegetable oil, cigarettes and cement. The main bottlenecks of industries are shortage of skilled labour and difficulty in securing plants from abroad.

With the exception of petroleum, the minerals of Iraq are not important. The oil-fields are found in the north east from where a pipe-line has been extended to Haifa and Tripoli on the Mediterranean coast—a distance of about 1,200 miles. Iraq raises a little above 4 million tons of petroleum every year.*

The principal exports are grains, pulses and flour, dates and horses. The imports are iron and steel goods, cotton piece-goods, sugar, tea, chemicals, silk goods and hides and leather.

The important trade centres are Basra and Baghdad. Basra is situated on the Western Bank of the Euphrates about

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* The Iraq Petroleum Company has very extensive concession which covers Iraq, Palestine, the Trans-Jordan, Syria and the Lebanon and is actively progressing. From its Kirkuk oil-field, it obtained in 1945 4,000,000 tons of oil. This oil is pumped through two pipelines to the Mediterranean coast at Tripoli in the Lebanon and Haifa in Palestine. The oil pumped to Tripoli has at present to be taken in tankers to Haifa to be refined. There are no refineries at Tripoli yet, though there is talk of building them in future.

The Iraq Petroleum Company intends to duplicate its two pipelines by two more lines, each 16 inches in diameter. This will more than double the output of oil from Iran.

59 miles from the Persian Gulf. The river is navigable by ocean-going steamers to Basra, whence smaller vessels ascend the Euphrates and the Tigris to Baghdad. Basra is the principal port of Iran. Its proximity to Iran, Arabia and the Persian Gulf makes it a trading centre of high importance. The chief exports are dates, barley, wheat, paddy, wool and carpets.

The trade centres are *Basra, Baghdad, Mosul* and *Kirkuk*.

Afghanistan :—It has an area of about 245,000 square miles and extends 400 miles from north to south and 600 miles from east to west. It is a mountainous country and is generally barren. Agriculture is pursued on the river valleys with the help of irrigation. The important agricultural products are wheat, barley and tobacco. Fruits are grown extensively and form an important item of commerce. Afghanistan contains a varied list of minerals. Both iron ores and coal are found in large quantities in the mountain regions of Central Afghanistan. Pastoral industry is practised for meat and wool. Trade and commerce are hindered by lack of communication, capital and capital goods and by extremes of climate.

Afghanistan is self-sufficient in foodstuffs. Fruits and sheep meat form main diet of the people.

The mineral resources are as yet undeveloped. Copper, lead, iron, petroleum are known to exist in good quantities, but lack of capital and technical skill is the problem. There are factories for the manufacture of woollen goods, leather, matches, cotton goods and sugar.

There are no railways in the country. Access to Afghanistan is mainly through passes like the Khyber Pass, Gomal Pass, Kurram Pass. The country has a large frontier trade with Pakistan, Iran and Turkistan. The exports are wool, fruits and silk. The chief imports are cotton piece-goods, metals, leather and arms and ammunition. *Kabul, Kandahar* and *Herat* are the principal trade centres.

The Afghans are brave and they can die to protect guests. Within recent years they have made much progress in commercial and industrial activities. The population of Afghanistan is about 12 million of which 2 million are nomadic tribes.

Arabia :—Arabia is divided into a number of autonomous States, although certain areas are under British Protectorate.

The greater part of Arabia is accessible to the sea. It comprises an area of 1,200,000 square miles with a population of nearly 6 million. The country is practically a desert, with no lake or navigable river. The relief is mountainous with lowlands near the sea-sides. Horses are famous. Agriculture is carried on in the lowlands near the sea-side. The famous moka coffee is grown in Yemen. Pearl fishery is important in the Persian Gulf. Desert climate, inadequate transport facilities and the nomadic character of the people have retarded the general trade development of the country. Coffee, dates, pearls and dried fruits are the principal exports while textiles, arms and ammunition, sugar and rice are the imports. The principal towns are *Muscat, Mecca, Jeddah* and *Medina.*

Aden is a British colony in south-west Arabia 100 miles from the entrance to the Red Sea. It has great importance as a naval and air-force station. Aden produces large quantities of salt and manufactures cigarettes. It has also a large distributing trade in cotton goods, coffee, sugar and tobacco.

Asiatic Turkey or Anatolia has an area of about 290,000 square miles with more than 15 million people. The situation of the country at the junction of Asia, Europe and Africa has influenced greatly its political, social and economic development. Turkey has natural frontiers on all sides and is bounded on the west by the Aegean Sea, on the south by the Mediterranean and Iraq and on the east by the mountains. Before the construction of the Suez Canal, Turkey dominated caravan traffic between Asia and Europe. It is through Turkey, again, that a possible railway route between India and Europe may be built in future.

Adherence to old customs, religious prejudices and lack of coal and iron ore retarded so long its industrial and political development. Thanks to the introduction of Ata Turk's *forward policy,* much progress has been made in recent years in various directions.

Geographically, Asiatic Turkey may be divided into three regions: (*a*) the Mediterranean climate region of the south and west coast, (*b*) the north coast region, and (*c*) the Central Plateau where the climate is of extreme type.

Agriculture is the main occupation of the country, supporting as it does more than 75 per cent. of the people. Citrus fruits, olives, grapes and tobacco are cultivated on the Mediterranean coastal region. Wheat, cotton and barley are also cultivated.

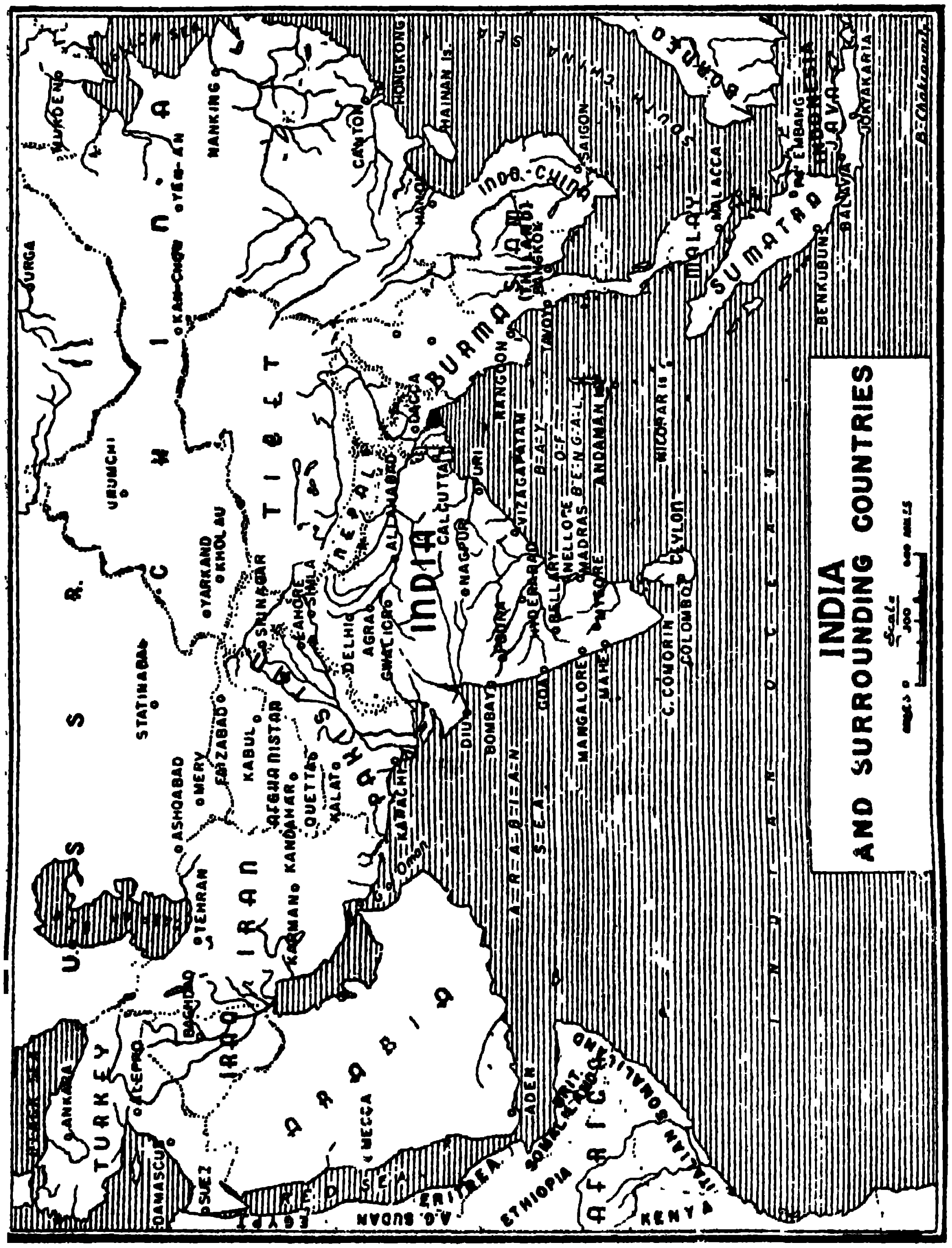

Fig. No. 83.

There are about 12 million sheep which yield coarse wool for the manufacture of carpets. The hair of goats supplies the materials for the manufacture of mohair.

Turkey has a varied list of minerals like coal, lead, copper, emery, boracite and chromium, but mining is not fully developed. Turkey supplies about one-sixth of the world's chromium. The ore deposits are scattered over Asia Minor, and in the south along the Mediterranean coast. The country is also rich in forest resources. There is also a considerable amount of unharnessed waterpower. Cottage industry, even to-day, remains more important than the factory system. The principal manufactures are rugs, carpets, cigarettes, sugar and cotton goods.

Transport facilities are inadequate in Turkey. The country has only 5,000 miles of railways. In recent years Turkey's foreign trade has increased much. The exports consist of tobacco, raisins, raw wool and raw cotton, and the imports are iron and steel goods, textiles and sugar.

Large cities are few in Turkey. *Ankara* in Inner Anatolia is the capital of the Republic. *Ismir, Adana, Konya* and *Bursa* are other important cities.

QUESTIONS

1. Discuss the nature of commercial exchange between India and the Middle East. Do you believe that the latter is a potential market for India's exports, particularly of manufactured goods? (Cal. B. Com. 1937).
2. Write short notes on the following: Tel-Aviv, Haifa, Aden, Ankara, Basra, Teheran and Kabul. In each case describe its situation and geographical causes that have contributed to its importance.
3. Write an account of Iran under the headings: Position, Boundaries, Drainage, Climate and Products.
4. Describe the route or routes by which civil supplies from outside reach the Middle East. What is the position of India's exports of textile goods in this market? (Cal. B. Com. 1943).
5. The allied countries produced enough synthetic rubber to meet the deficiency caused by the loss of supply from the Japanese-occupied regions during the World War II. What, in your opinion, is the position of this industry now that normal times have returned?
6. Describe the economic resources of the Middle East. To what extent the world markets are dependent on them?
7. Describe fully the petroleum resources of the Middle East and their present exploitation. (Cal. B.A. Hons. 1951).
8. Iran occupies an important position in the oil industry of the world. Do you think that the recent decision by Iran to nationalise her oil industry will have repercussions on the world oil industry? (Cal. B. Com. 1951).

CHAPTER XVI

THE REPUBLIC OF INDIA*

The Republic of India measures 2,000 miles from north to south and 1,000 miles from east to west and presents the form of a somewhat irregular equilateral triangle. The Indian Republic has 11,38,814 square miles of area with 357 million population including Kashmir. Administratively, the Republic consists of 29 States which are Assam, Bihar, Bombay, Madhya Pradesh, Madras, Orissa, Punjab (I), Uttar-Pradesh, West Bengal, Hyderabad, Jammu and Kashmir, Madhya Bharat, Mysore, Patiala and East Punjab States Union, Rajasthan, Saurashtra, Travancore and Cochin, Ajmere, Bhopal, Bilaspur, Coorg, Delhi, Himachal Pradesh, Cutch, Manipur, Tripura, Vindya Pradesh, Andaman and Nicobar Islands and Sikkim.

India occupies a highly favourable situation for the purposes of international commerce. She stands almost at the centre of the Eastern Hemisphere and at the head of the Indian Ocean. She commands all the sea routes for trade between the old and the new worlds—towards Africa and Europe in the west, Australia in the south—Siam, China, Japan and America in the east. India can rightly boast of possessing "natural frontiers", shut off, as she is, by the Himalayas on the north, by the Arabian Sea on the south-west and by the Indian Ocean on the south.

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* Before the partition in August 1947, India comprised an area of 15,75,107 square miles, of which 10,84,774 square miles, or 60 per cent. were under the British. The remainder consisted of Indian States and foreign possessions divided between France and Portugal. The population of the Indian Empire (British India and Indian States) was nearly 390 million. The foreign possessions had a total population of 8,70,000 people in an area of 1,274 square miles. By the division of India, three-fourths of the entire population of the country as well as two-thirds of the entire area have come under the Indian Union. The partition of India has brought in its wake serious consequences for the economic development of the Indian Republic. It means, in the first place, the diminution of population by 70 million (although soon after partition, about 6 million people were forced to leave their homes in Pakistan and migrate to India); and, in the second place, Indian Republic lost with these territories (now constituting Pakistan) rich economic resources in jute, cotton, hides and skin, petroleum, rock salt, chromite etc. Thirdly, the textile industry is facing the critical problem of raw materials. Calcutta's jute mills are much dependent on Eastern Pakistan for supplies of raw jute; the cotton industry, too, has to depend to a certain extent on Pakistan raw cotton.

India has a coast-line of 3,500 miles, which gives one mile of coast to every 400 square miles of area. The coast-line of India, in spite of its great length, is broken by only a small number of inlets and possesses a few islands round it. The continental shelf of the country is shallow and the shores are usually flat and sandy. Because of these physical characteristics India possesses few ports and harbours in proportion to her coast-line. The Gulf of Cutch, the Gulf of Cambay, the backwaters of Cochin and Malabar, the Palk Strait and the Gulf of Mannar, and the indentations at the mouths of the Ganges are the inlets and straits of India. These are all shallow with the exception of the *backwater* of Cochin and Malabar and permit navigation when they are made deep by dredging operations.

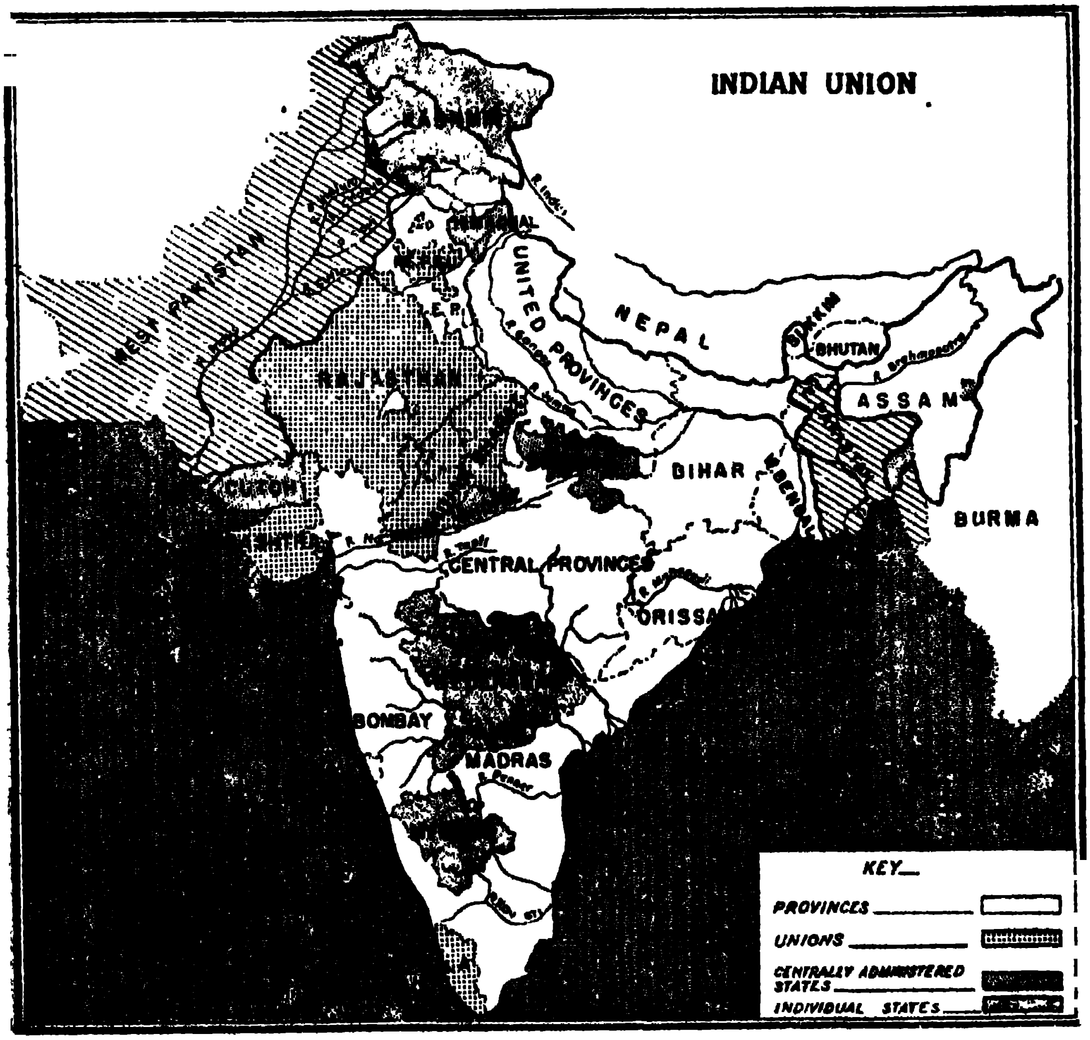

FIG. No. 84.

The east coast of India runs from the mouth of Kalindi in Khulna on the border of Eastern Pakistan along the Sundarbans in a westerly direction, to the Hugli river. From the Hugli, the coast proceeds south-west to the Kistna Delta, from where it continues south to Cape Comorin which is the southernmost point of India. *The west coast* runs from Cape Comorin. The coast runs north to the Gulf of Cambay, where the Kathiawar Peninsula juts out west from the mainland. The coast continues north-west from Kathiawar. [The opening (*i.e.*, the gulf) between the north-west coast and the peninsula is known as the Gulf of Cutch].

The Natural Regions

A region of such a vast extent is naturally of diversified configuration—plains, plateaux and mountains. Geographically India presents three natural divisions, each of which is quite unlike the other. These divisions are based on physical conditions.

I. The Mountainous regions of the North.
II. The Indo-Gangetic plain.
III. Peninsular India.

I. *The mountainous regions of the north.* The Himalayas run for 2,000 miles from the eastern extremity of Assam to the western limits of Kashmir with a breadth varying from 180 to 220 miles and contain some of the highest peaks in the world. The Himalayas, a series of parallel ranges intersected by valleys and extensive plateaux, rise abruptly from the plains in the east and gradually in the west. The average height of the Himalayas is over 17,000 ft., and about forty peaks are known to exceed 24,000 ft. The best known of these peaks include Nanga Parbat (26,630 ft.), Nanda Devi (25,660 ft.), Dhavalgiri (26,820 ft.), Mount Everest (29,002 ft.), and Kanchinjinga (28,150 ft.). *The snow-line* is at a height of about 16,000 feet on the southern slopes of the Himalayas and higher on the northern. These highlands are almost entirely part of the *New fold mountains of* Asia, and consist of long lines of folded ranges of comparatively recent formation. "They form great arcs, curved convexly towards the south or as in the north-east, diverging ridges radiating from a northern mountain complex."

Three distinct parallel ranges are noticeable in the Himalayas: (a) The *Great Himalayas** comprising the highest portion with an average height of 20,000 feet, (b) the *Lesser Himalayas* comprising the ranges with an elevation of less than 15,000 feet, and (c) the *Outer Himalayas* comprising the hills lying between the Lesser Himalayas and the plains. In front of the Outer Himalayas, lies the Terai jungle—the abode of many wild beasts.

The Himalayan chain acts as a natural protective wall for India and provides rain-water for the plain by arresting the moisture-bearing clouds of the south-west monsoon. And in winter it prevents the piercing cold winds of Central Asia from coming into India. It gives birth to mighty rivers like the Indus, the Ganges and the Brahmaputra. The Lesser and Outer Himalayas are very rich in animal and forest resources. There are extensive tea plantations in the Outer Himalayas from Assam to the East Punjab. Physical difficulties do not permit cultivation except in the Lesser Himalayas where rice, chillies, ginger, tea, wheat and fruits are raised.

The scenery and the mighty peaks of the Great Himalayas attract tourists and climbers from different parts of the world and thus provide a source of income to many hill stations. Because of such influx of people, many hill stations have developed hotel industry in India, although it is not comparable to what exists in such countries as Switzerland and Italy.

II. *The Indo-Gangetic plain.* This northern plain, situated towards the south of the newfold mountain belt, is part of a great depression which is traceable across northern Africa, southern Europe and southern Asia. The plain of Hindusthan occupies the greater part of northern India and covers more than 1,500 miles from east to west with a width of 200 miles. This plain is formed by the basins of the Ganges, the Indus and the Brahmaputra with their tributaries and has been the cradle of Indo-Aryan civilisation from the earliest times. The geographical advantages are (*a*) fertile soil, (*b*) favourable climate, (*c*) flat surface rendering possible the construction of roads and railways, (*d*) rivers and (*e*) mineral products, etc. In the *Gangetic plain,* rainfall is heavy and agriculture is the chief occupation of the people. It contains more than 40 per cent. of the total population of India. *The Western plain* beyond the Ganges is more or less dry. Agriculture is practised with the help of irrigation. Although the region contains only 10 per cent. of India's population, it has an extensive and well-developed system of irrigation.

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* The Great Himalayas, again, contain four sections: (a) The Kashmir Himalayas, (b) the Kumaun Himalayas extending from the Sutlej to the Kali, (c) the Nepal Himalayas extending from the Kali to the Teesta river, (d) the Assam Himalayas extending from the Teesta to the easternmost frontier of India.

III. *Peninsular India* is a tableland and lies within the tropics. This tableland is part of an ancient plateau land of unfolded rock of primary origin largely crystalline in character.* It is bounded on three sides by mountains—on the north by the Vindhya and the Satpura ranges including the Malwa and the Aravalli plateaux, on the west by the Western Ghats and on the east by the Eastern Ghats. Two coastal strips of flat land exist on the outer side of both the Western and Eastern Ghats—the western coastal strip is known as the Konkan in the north and Malabar in the south ; the Eastern coastal strip is known as the Coromondal Coast.

The Western Ghats run along the Malabar coast of India continuously for a distance of about 1,000 miles down to Cape Comorin. The plain between the Ghats and the sea is 30 to 40 miles wide. The Ghats look like an immense wall facing the ocean. The mean height is about 3,500 feet, the highest point being 8,700 feet (Dodabetta). The important passes connecting the Central tableland with the west include the Palghat, the Thal, Bhoghat and Nama. The Nilgiris form the converging point of the Western and Eastern Ghats by which the Deccan is enclosed.

The Eastern Ghats stretch from the Mahanadi river valley for about 500 miles south-eastwards to the nucleus of the Nilgiris. The mean height of the Eastern Ghats is scarcely more than 1,500 feet. The Eastern Ghats are much less elevated and do not form a continuous chain like the Western

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* Similar plateaux compose parts of Africa, Arabia, South America and Australia and it is reasonable to suppose that all these areas were once continuous. Similar features of relief are found in all, such as flat-topped highlands, almost vertical valley sides, terrace-like differences in elevation and lava outpourings along fault lines.

Ghats. The Eastern Ghats are at a much greater distance from the coast, the intervening lowlands averaging from 50 to 80 miles.

As the general slope of the tableland is from west to east, most of the rivers flow into the Bay of Bengal. The Mahanadi, Kistna, Pennar, Cauvery and Vaigi flow into the Bay of Bengal ; the Tapti and Narmada flow into the Arabian Sea. The Peninsular rivers are all rain-fed, and they turn into mere puddles during the dry season. The principal agricultural crops are cotton, tea, coffee, and spices. Cinchona, cocoanut and forest products are also available.

In the Deccan, there are five natural divisions : (*i*) The narrow west-coast region from Tapti to Cape Comorin receives the full force of the current of the monsoon from the Arabian Sea and therefore rainfall is over 100″. The soil is very fertile and the crops are rice, spices and fruits. The density of population is near about 400 per sq. mile. (*ii*) The Black Soil region consists of deep basaltic soil, which is highly retentive of moisture and therefore does not stand in need of irrigation. It is extremely fertile and owing to the lime it contains, the region is suitable for cotton growing. Millets, oilseeds and wheat are also cultivated. (*iii*) North-eastern Deccan has poor soil, but the rainfall is over 50″. Tank irrigation has most developed. Rice is the principal crop. (*iv*) Southern Deccan is a *rain-shadow area,* and is frequently visited by famine. The soil is very poor and cultivation is possible only by means of irrigation. Population is scanty. (*v*) The Eastern coastal plain is a low, alluvial land. The northern portion has summer rain and the southern region has winter rain. The coast-line is broken by the deltas of the rivers and many lagoons. The average rainfall is between 40″ to 50″. Rice is the principal crop. Millets and indigo are also raised.

Distinction Between Northern and Peninsular River

It is necessary to distinguish between the Himalayan rivers and the Peninsular rivers. The Himalayan rivers have a flow of water throughout the year. Even in summer the rivers receive water from the melting of the Himalayan snow. Flowing through the broad basins they form large tracts of rich alluvial soil on either side. It is no wonder, therefore, that their fertile basins are the natural granaries of the country. The Ganges and the Brahmaputra are navigable and provide excellent waterways for commerce. The irrigation works of the East Punjab, Bihar and U. P. depend absolutely on these rivers and their tributaries.

The Peninsular rivers, on the other hand, have water during the monsoons, but shrivel into muddy pools in the dry season. These rivers are of little use for navigation on account of their torrential nature in the upper courses, and the rapids that occur where they descend into deep gorges from the tableland to the coast plain. With the exception of the Mahanadi, the rivers of Peninsular India are never useful as carriers of commerce.

The Climate of India

India is so vast in size and so varied in topographical features that a uniform climate does not prevail all over the

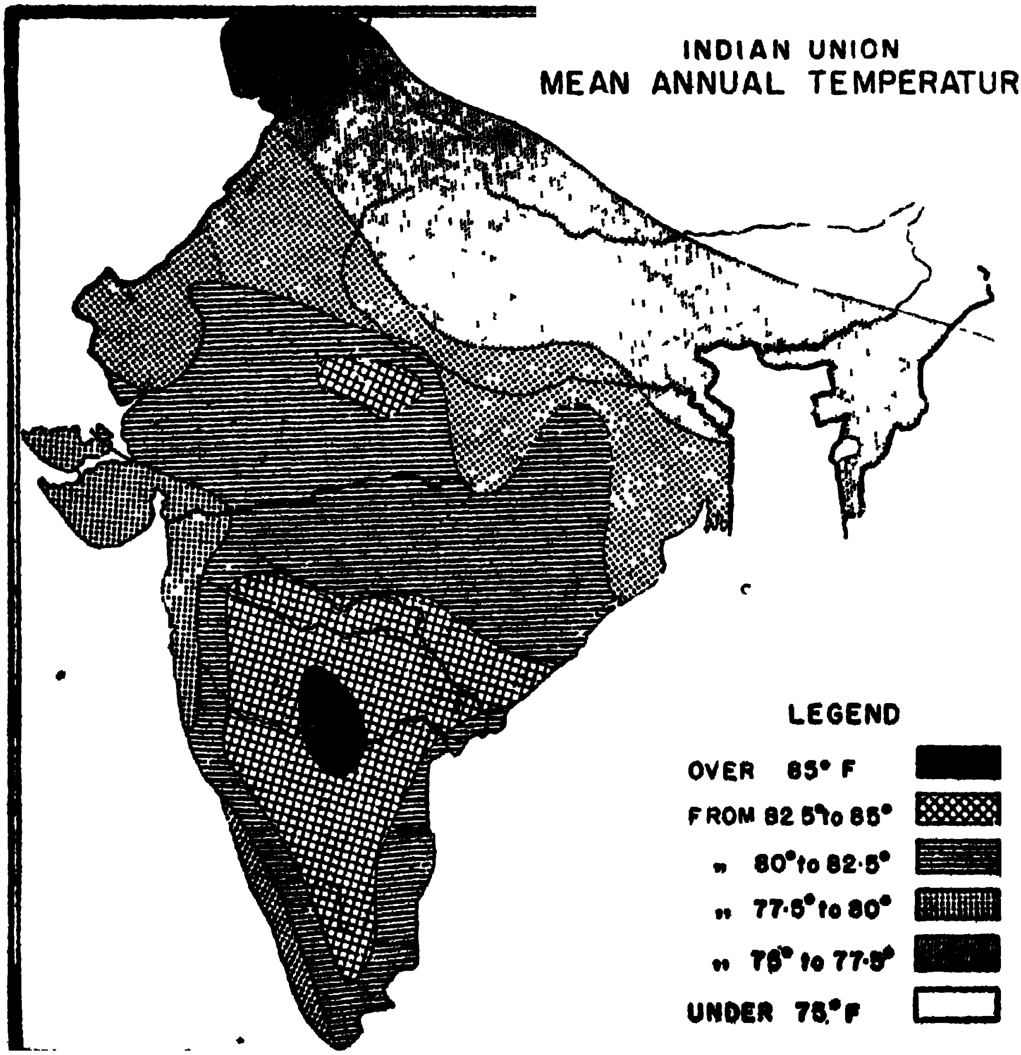

FIG. No. 85.

country. For the purpose of climatological studies it is useful to divide India into two parts—Peninsular India and Northern India. Peninsular India has the characteristics of a tropical climate. The temperature is uniformly high and its seasonal variation relatively low.

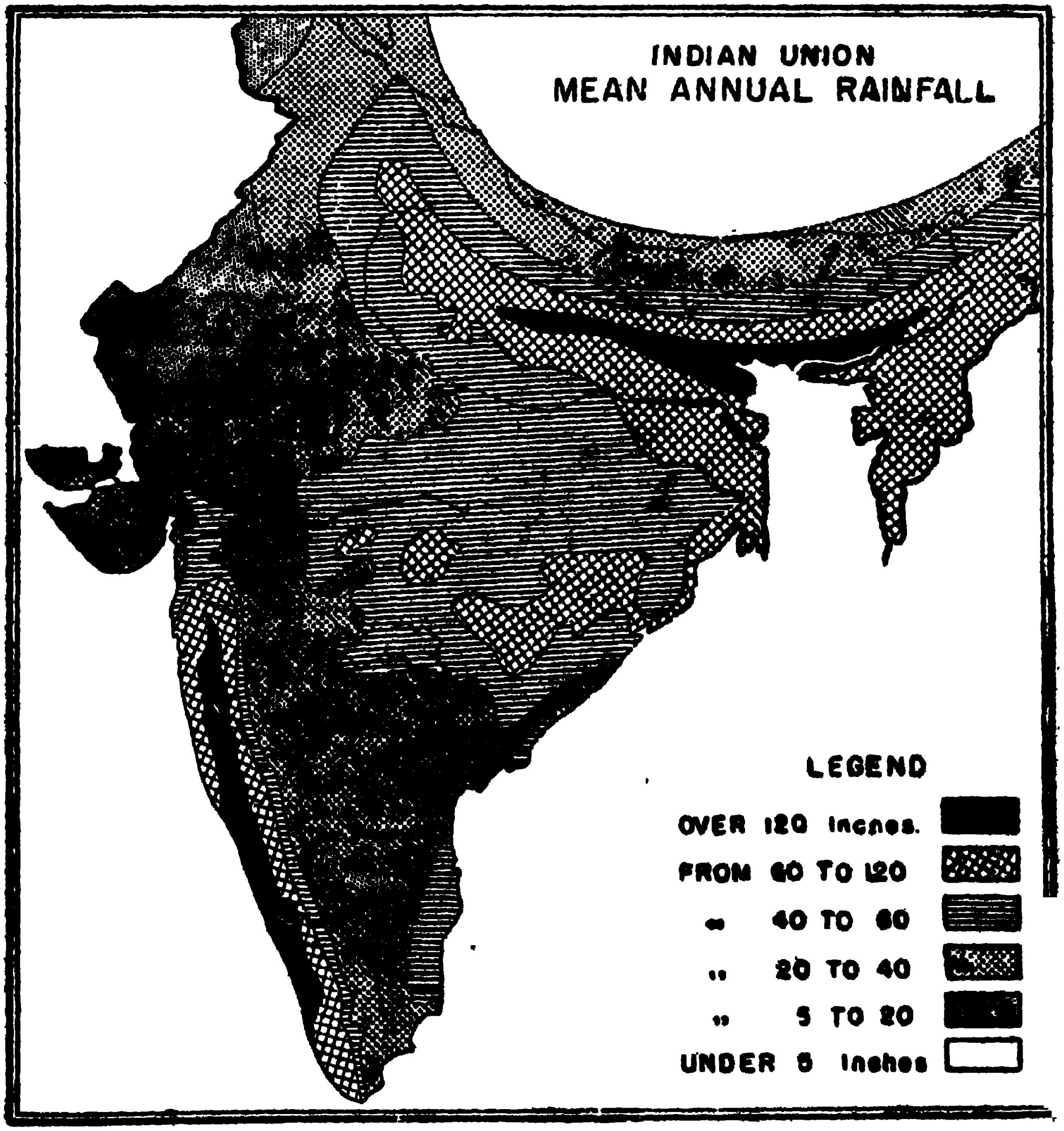

Fig. No. 86. The normal rainfall varies from an average of 460 inches at Cherrapunji in Assam to 5 inches in Rajasthan, the average for the whole country being 42 inches.

Northern India lies beyond the Tropic of Cancer. In this region climatic conditions are never similar in all the places. The western side is very hot in summer and very cold in winter. Air is generally devoid of moisture. But in the eastern side winter is mild and summer is hot with plenty of moisture in the air. The western side includes East Punjab and Rajputana.

The eastern side embraces West Bengal, Assam, Bihar and the U. P.

These climatic conditions are disturbed by the monsoon winds. The word "Monsoon" comes from the Arabic word "Mausim" (meaning season) and in India monsoon means the rainy season. There are two Monsoon currents—The South-West Monsoon and the North-East Monsoon. The South-West Monsoon, blowing in-shore, carries with it particles of water and gives rain from June to September. The South-West Monsoon contributes nearly 90 per cent. of the total rainfall in India and reaches the country in two currents—the Arabian Sea current and the Bay of Bengal current.

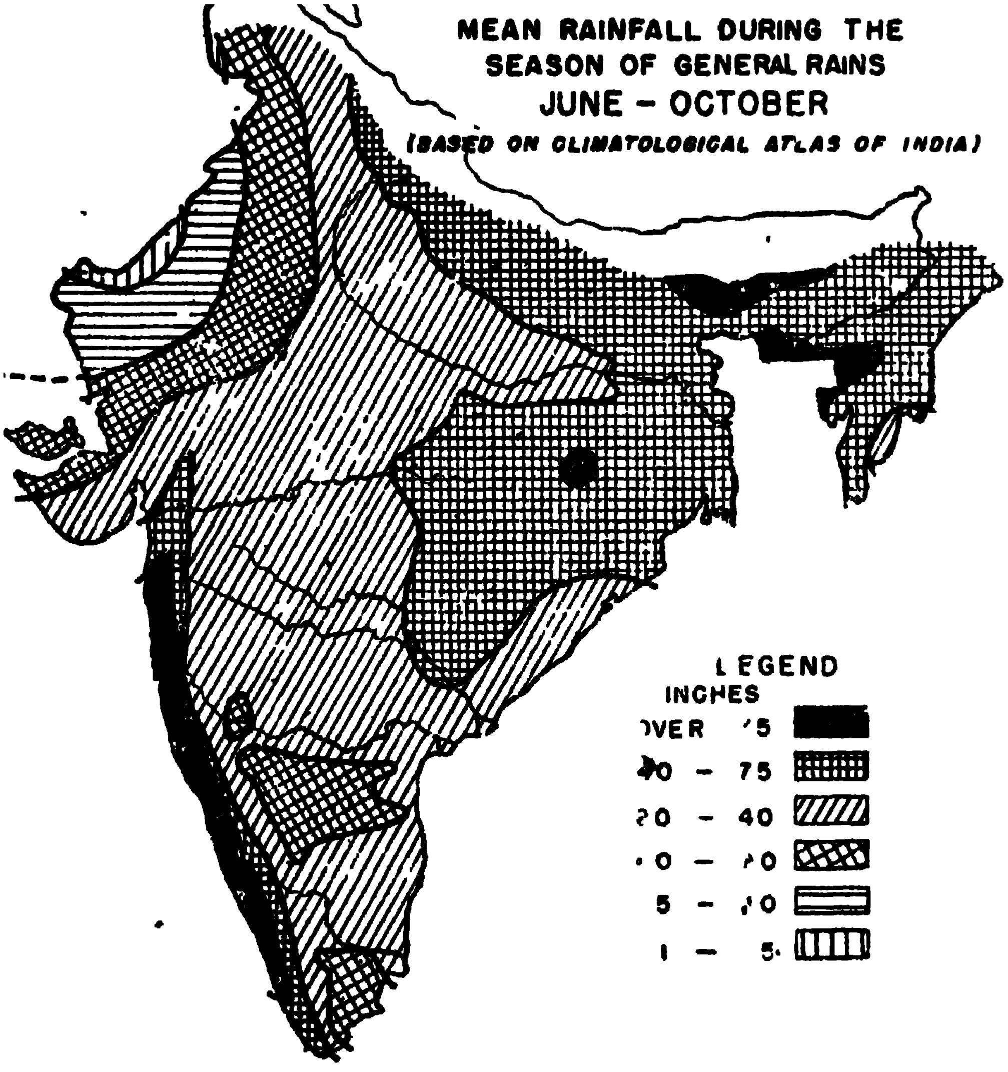
MEAN RAINFALL DURING THE SEASON OF GENERAL RAINS
JUNE - OCTOBER
(BASED ON CLIMATOLOGICAL ATLAS OF INDIA)
LEGEND
INCHES
OVER 75
40 - 75
20 - 40
10 - 20
5 - 10
1 - 5

FIG. No. 87. The major portion of the rainfall comes during the South-West Monsoon period from June to October except in the south-east part of the Peninsula.

The Bay of Bengal monsoon current, after being obstructed by the Arakan mountains and the Shillong plateau on the east, and the Himalayas on the north, proceeds westward up the Gangetic plain and causes copious rainfall in Assam, Bengal, Bihar and the U. P. *The Arabian Sea monsoon,* after surmounting the Ghats and giving rains to the Deccan and C. P., meets the Bay of Bengal current in Bengal and Assam. This combined monsoon is responsible for heavy rainfall in Bengal and Assam.

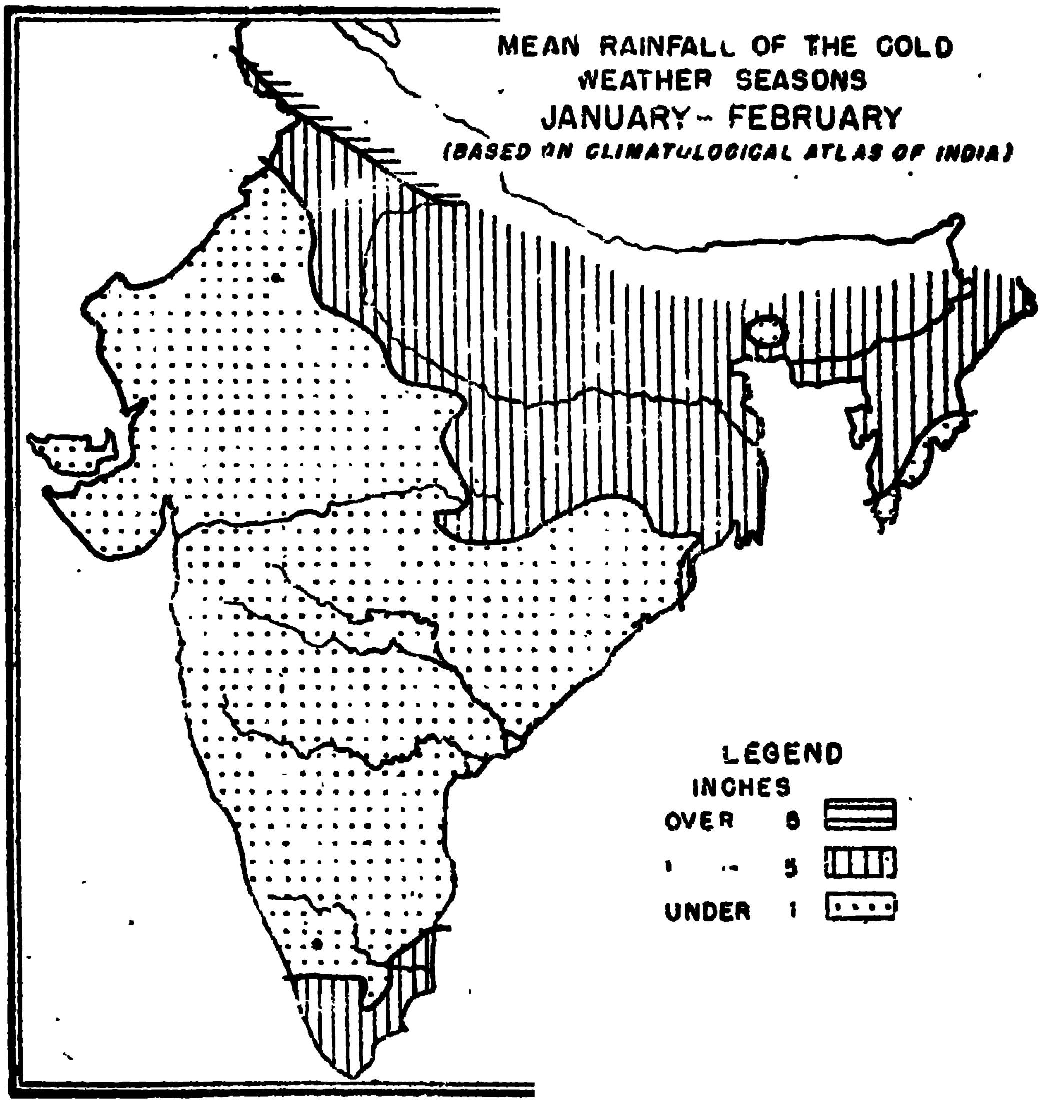
MEAN RAINFALL OF THE COLD
WEATHER SEASONS
JANUARY - FEBRUARY
(BASED ON CLIMATOLOGICAL ATLAS OF INDIA)
LEGEND
INCHES
OVER 5
1 - 5
UNDER 1

FIG. No. 88. During January-February, the precipitation in North India is due to the north-east Monsoon. It is scanty but essential for the production of *rabi* crop.

The South-West monsoon begins to retreat from Northern India in the early part of October, and the retreat becomes complete by mid-December. "This retreat is associated with dry weather in Northern India but with more or less general rain on the coastal districts of Madras and over the eastern half of the Peninsula."

The *North-East* wind begins in January and lasts till March. At this period dry winds from the belt of high pressure in Central Asia (from the West Mediterranean to Central Asia, and North-East China) pass eastward to Persia and Northern India and cause light rain in Northern India, particularly in the Punjab plains. This rainfall, though scanty, is very important for the *kharif* crops. Another current of cold winds after crossing the Eastern Himalayas moves towards the Madras coast and Ceylon, and gives rain to these areas.

The average annual rainfall in India is 42 inches and the variations from this normal rainfall are surprisingly great. The overall departures from the normal are as great as + 12″ and − 11″. These variations affect the growth and yield of crops adversely. Again, the distribution of rainfall in India depends largely on the physical features. "If the hills and mountains of India were effaced, the country would receive much less rainfall and would not be able to support its present population."*

The economic importance of rainfall in India is of the highest order, inasmuch as rainfall is an imperative necessity for agriculture. The prosperity of most Indian districts depends on the success or failure of the monsoon, and a very slight variation in the direction of the wet winds may cause a usually well-watered district to become a desert.

One of the chief characteristics of rainfall is its unequal distribution over the country. Some Indian provinces always obtain abundant rain, and some never get more than an inch or two per annum, whilst over large areas the rainfall is uncertain. *It is not the average rainfall of any province, but the deviation from the normal average, together with its timely distribution, that may cause disaster.* A deficiency in the expected rainfall causes famine, and too much rain spoil the crop, while the early or late arrival of the monsoon may spoil the harvest.

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* Normand, *The Weather of India.*

The most useful classification of areas, according to rainfall, is made into two great zones,—*'certain'* and *'uncertain'*. The zones of *certain rainfall* include Bengal, Assam, the West Malabar Coast, the Western slopes of the Ghats and the Upper valley of the Narmada.

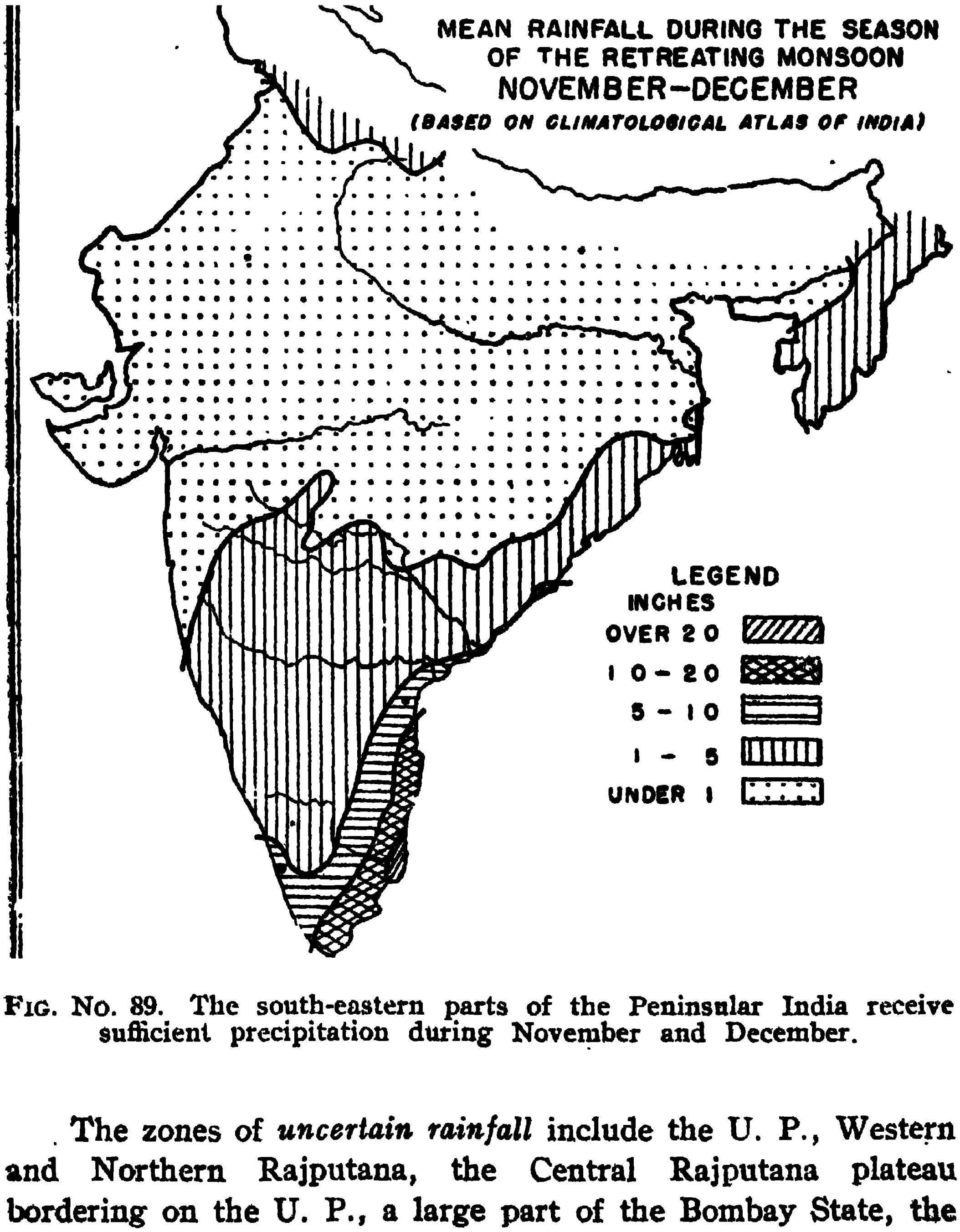
MEAN RAINFALL DURING THE SEASON
OF THE RETREATING MONSOON
NOVEMBER–DECEMBER
(BASED ON CLIMATOLOGICAL ATLAS OF INDIA)
LEGEND
INCHES
OVER 20 ▨
10 – 20 ▩
5 – 10 ▤
1 – 5 ▥
UNDER 1 ⬚

FIG. No. 89. The south-eastern parts of the Peninsular India receive sufficient precipitation during November and December.

The zones of *uncertain rainfall* include the U. P., Western and Northern Rajputana, the Central Rajputana plateau bordering on the U. P., a large part of the Bombay State, the whole of Madras (except the actual slopes of the Eastern Ghats), South and West Hyderabad and Mysore and some districts of Bihar and Orissa.

· The existence of these extensive zones of uncertain rainfall has been the cause of India's famines.

The Control of Famines: We cannot control rainfall in which either deficiency, irregularity or super-abundance may give rise to disastrous famines. We can, however, provide measures to reduce famines. Chief among these are promotion of railways ; extension of irrigation ; reclamation of wasteland ; agricultural improvements such as cultivation of proper crops and introduction of a scientific system or rotation of crops and, where necessary, revision of the revenue and rent systems. Therefore, although droughts occur frequently in the interior districts of India, the result is not necessarily famine.

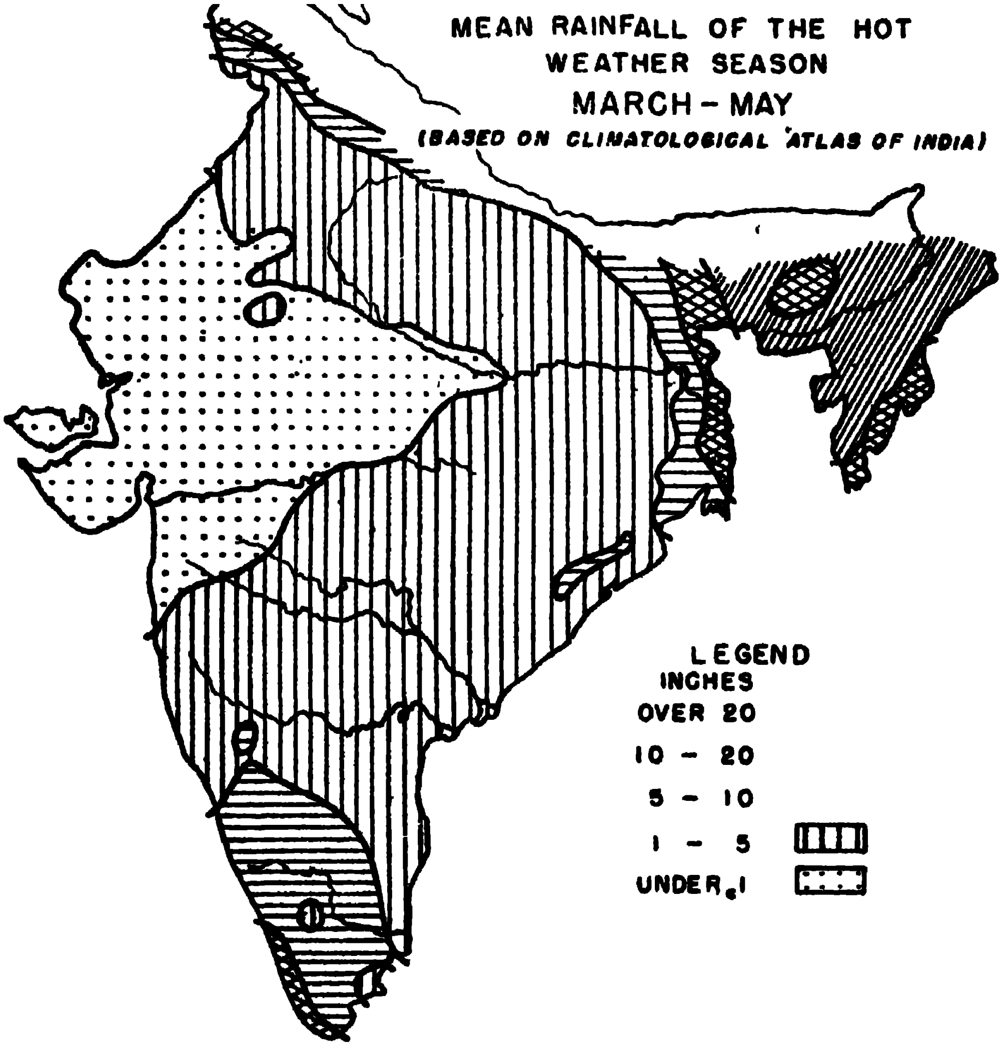
MEAN RAINFALL OF THE HOT WEATHER SEASON
MARCH - MAY
(BASED ON CLIMATOLOGICAL ATLAS OF INDIA)
LEGEND
INCHES
OVER 20
10 - 20
5 - 10
1 - 5
UNDER 1

FIG. No. 90. Assam, eastern border of West Bengal and the narrow coastal strip in Travancore and Cochin receive abundant rain in March-May.

Soils and Soil Regions

A productive soil is the most important factor for successful agriculture. Soils differ in their capacity to produce crops. Some are fit for profitable agriculture, others are impoverished by soil-depleting practices ; and still others are poor to start with but made fertile by efficient management. The various types of soil that are found in India have been influenced in their formation by the wide diversity in geology, topography and rainfall.

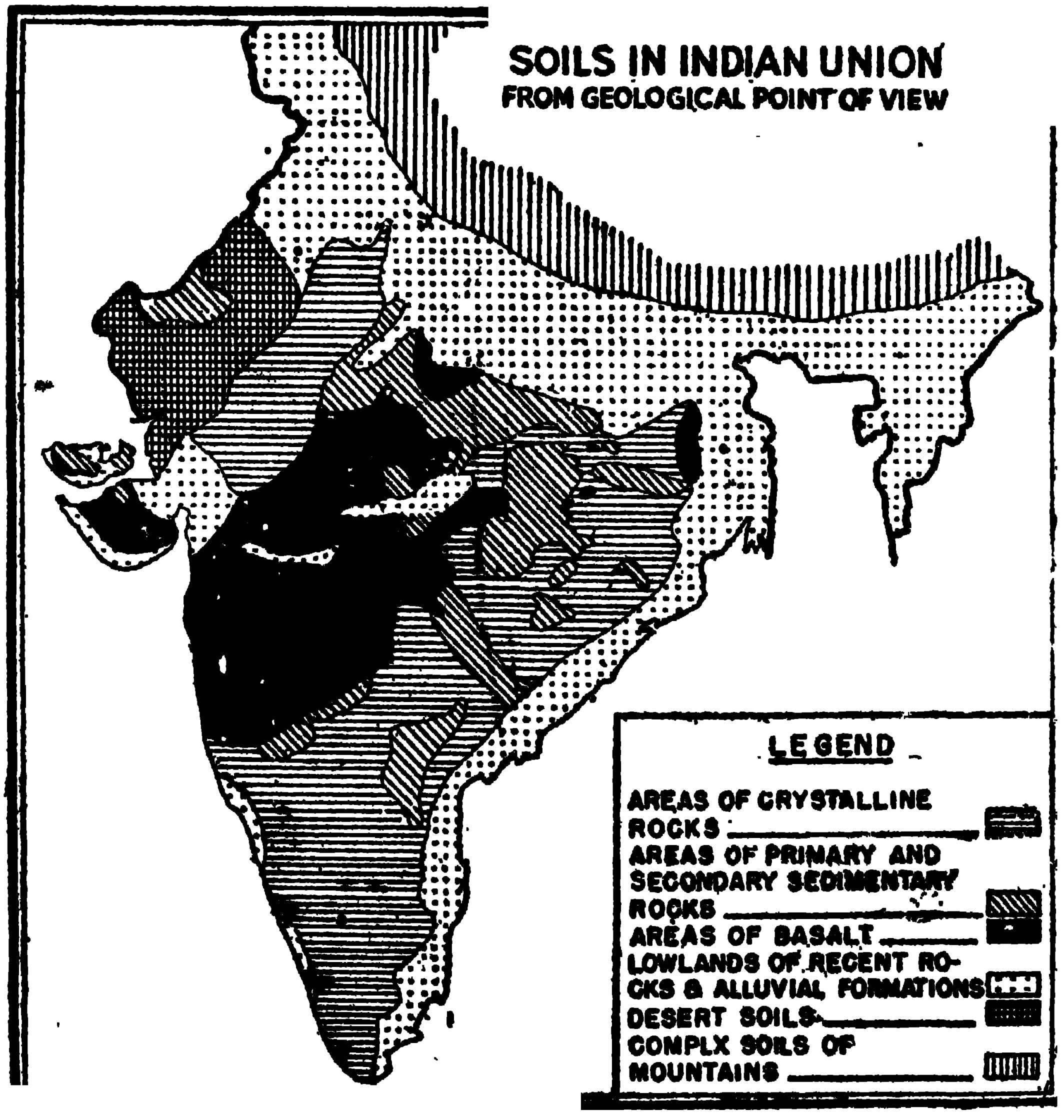
SOILS IN INDIAN UNION
FROM GEOLOGICAL POINT OF VIEW
LEGEND
AREAS OF CRYSTALLINE ROCKS
AREAS OF PRIMARY AND SECONDARY SEDIMENTARY ROCKS
AREAS OF BASALT
LOWLANDS OF RECENT ROCKS & ALLUVIAL FORMATIONS
DESERT SOILS
COMPLX SOILS OF MOUNTAINS

FIG. No. 91. Soils in India play a great part in the development of agriculture and the distribution of population.

Since there has been no systematic soil survey of India, it is very difficult to give a correct description in regard to the composition and characteristics of Indian soils. However, eight soil regions are generally recognised in India some of which are quite inclusive of a rather wide variety of soil conditions while others have quite uniform and consistent soil characteristics throughout.[*]

- (*i*) Alluvial soils including deltaic, coastal and inland alluvium.
- (*ii*) Black soils including the regur and shallow grey black soils of M. P.
- (*iii*) Red soils including red loams and yellow earths
- (*iv*) Laterite soils.
- (*v*) Mountain and Hill soils.
- (*vi*) Terai soils.
- (*vii*) Arid and Desert soils (84,000 square miles).
- (*viii*) Peaty and other organic matter (3,000 square miles).

Agriculturally the most important soils are the alluvial ones which occupy extensive tracts of land, and include the greater part of Gujarat, Rajputana, East Punjab, the Uttar Pradesh, Bengal, the Godavari, Kistna and Tanjore districts of Madras and Assam. The eastern and western coastal lands of the Deccan are lowlands of alluvial formations.

The alluvial soils are rich in chemical properties and are capable of yielding a large variety of *rabi* and *kharif* crops. In characteristics, these soils belong to the *Brown Steppe* soil group which is found in Russia, North America, Australia, Africa and South America—usually at the fringe of desert soils.

The alluvial soils of the Upper Ganges valleys are dry, porous and in some places sandy, yielding crops that do not need the retention of much moisture about their roots. At present in these areas cultivation has much developed with the help of irrigation. The level country and the absence of hills make it easy and comparatively cheap to make canals and distribute the water over the length and breadth of the country. The alluvial tracts of Bengal are more compact, less coarse and more moist than elsewhere and yield rice, jute, sugar-cane, tobacco etc., rather plentifully. The alluvial soils of the Deccan coastal strips are non-porous, clayey and of a dark colour.

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[*] We get the earliest information about Indian soils from the *Land Settlement Records*. "The information is useful, but is insufficient and lacks a scientific background for efficient utilization of land." Soils in India were also studied *from a geological point of view* by the Geological Survey of India. In Sind and Punjab, soil surveys were made for *irrigation purposes*.

The Black soils comprise the greater part of Bombay State, the whole of Berar, the western part of the Madhya Pradesh and the western part of Hyderabad. The soils of this region vary in different parts in character and productiveness. The soils are poor, thin and porous on the slopes and the uplands of the Deccan hills where millets and pulses are the main crops. In the lowlands, the soils are deeper and darker-coloured, suitable for wheat, millets and cotton. The most important soil in the Deccan trap area is the *regur* or *black cotton soil,* found mainly in the valleys of the Tapti, the Godavari, the Narmada and the Kistna and parts of Kathiawar, M. P. and the western portion of Central India. "This soil is the product of the decomposition of lavas. It is of a dark colour and is exceedingly compact and tenacious. It is highly retentive of moisture and rich in chemical properties." Cotton, jowar, wheat, linseed and gram are cultivated in these areas.

Red Soils comprise the whole of Madras, Mysore, and South-east Bombay and extend through the east of Hyderabad and the Madhya Pradesh to Orissa and Chotanagpur. It is also found to occur in the Santhal Parganas and the Birbhum district of West Bengal, the Mirzapur, Jhansi and Hamirpur districts of the U. P., Madhya Bharat and eastern Rajputana. The consistency, depth and fertility of the soil vary widely in different areas. The poor, sandy and light-coloured soils of the arid uplands yield only bajra, while the rich, deep, bright-red fertile loam of the plains produces a wide range of excellent crops. "Red soils are deficient in nitrogen, phosphoric acid and humus, but potash and lime are generally sufficient." Although the red soil tracts are drained by the Mahanadi, Godavari, Kistna and Cauvery, the use of water by means of canals for irrigation is absent because of the uneven surface except at the deltas. The construction of wells is difficult because of the rocky nature of the surface. The red soil areas are, however, admirably suited for storage of rain water in tanks. In Madras, Mysore and Hyderabad, cultivation is carried on with the help of tank irrigation.

The Laterite soil is found in Madhya Bharat, Assam and along the Western and Eastern Ghats. The soils are formed by the weathering of laterite rocks. "The distinguishing peculiarity of these soils is their acidity, and the main agricultural problem is the correction or amelioration of this acidity." Since the tea-plant requires acidity, tea-plantation is common in these areas. The laterite soil differs widely from one region to another. Generally speaking, they are poor on the higher levels and cannot retain moisture. In the plains, however, they consist of heavy loams and clays and can easily retain moisture.

Mountain and Hill soils are suitable for the growth of forests in the hilly parts of the north and specially Darjeeling, Almora and Garhwal districts. *Terai soils* are covered by tall grasses and shrubs of no agricultural value. These are found in a narrow strip in the Uttar Pradesh (U. P.) and Bihar between plains and hills including Nainital, Pilibhit, Kheri, Gonda, Basti and Gorakhpur. *Arid and desert soils* are found in Rajasthan and mostly contain sands, often with high soluble salt contents. These soils have very low organic matter. Certain parts of Cochin and Travancore contain *peaty and other organic matters*. *Sub-Montane soil* is confined to the whole of Simla, most of Kangra and part of Gurdaspur in East Punjab.

Problem of Soil erosion. For the successful agriculture in India, it is necessary to maintain a high fertility level of the soil. In other words, soil conservation is essential to continued agricultural prosperity.

Unfortunately, however, in India today many soils have become so depleted in fertility or so eroded that they are no longer suited to agriculture. Soil erosion is confined to Bundelkhund, Madhya Bharat, Bihar, parts of Bombay, Madras and East Punjab. In fact, soil erosion is an age-old problem.

The agencies of erosion are winds, water and waves of which, in India, the water erosion is most pronounced. There are three kinds of water erosion—*sheet, rill and gully*. Sheet or surface erosion takes place in the form of uniform removal of soil from the surface of sloping lands by rain-water. In the hill-tracts of Assam, North Bihar and Kumaun region of Uttar Pradesh, such loss of soil is steadily going on. Sheet erosion develops so slowly that its injurious effect is not noticed before serious damage is done.

Rill erosion is common in Bihar, Uttar Pradesh and parts of Madhya Bharat where rains cause formation of tiny gullies on bare soil. *Where such rills are enlarged, they are known as* *gullies.* Such gullies not only take away the surface soil but also sub-surface and sub-soil. Thus gullied lands are partially or completely abandoned by farmers although inter-gully areas are used for pasture.

In Rajasthan and Madhya Bharat, top soil is removed by the action of winds. From April to July, wind hurls sands from the western Rajasthan and covers not only the surface soil but also injures the plants with its abrasive action. The progress of the winds can be arrested by planting trees.

Soils vary in their resistance to erosion. A coarse soil can resist erosion because it can absorb the rains rapidly. . Erosion is also influenced by the slope of land. The slope determines the rate of flow of water over a surface. The speed of water in its turn determines its power of eroding.

The Government of India is taking a great interest in land use as a national problem and has prepared programmes for the control of soil erosion. Already in many parts of Northern India, soils which were poor to start with, have been made fertile and brought into production.*

THE DISTRIBUTION OF POPULATION

The most decisive productive force of a country is its distribution of population. The extent of utilization of the natural resources is much determined by the character and density of population.

The people of India are highly intelligent, enterprising and peace-loving. Their civilisation dates back to some 5000 years before Christian era. In art, literature, science, architecture and industry, the people achieved fame at a time when the rest of the world was almost dark. The vitality of the people of India has made itself felt in Burma, Ceylon, Malaya and Indonesia where we find a large number of Indians as Immigrants. The Indians have shown to the world that peoples of different races, languages and religions can live side by side in peace and unity when the rights of all are treated with tolerance and respect.

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* Roychaudhury and Mukherjee of the Indian Agricultural Research Institute have classified Indian soils as follows : (*i*) alluvial soil, (*ii*) alluvial soil impregnated with varying amounts of salts, (*iii*) coastal sandy alluvium, (*iv*) old alluvium, (*v*) saline and deltaic soil, (*vi*) calcareous soil, (*vii*) deep black soil, (*viii*) medium black soil, (*ix*) shallow clay loam, (*x*) mixed red and black soil, (*xi*) red loam, (*xii*) red sandy soil, (*xiii*) mixed red loam and red sandy soil, (*xiv*) gravelley soil, (*xv*) sub-montane soil, (*xvi*) Terai soil, (*xvii*) marshy land, (*xviii*) Peat soil, (*xix*) desert soil. (Vide *Journal of Scientific and Industrial Research*, October, 1947).

GEOGRAPHICAL DISTRIBUTION OF POPULATION (1951 CENSUS)

States	Area (in square miles)	Populatio (in million
Assam	54,084	9·1
Bihar	70,368	40·2
Bombay	115,570	35·9
Madhya Pradesh	130,323	21·7
Madras	127,768	56·9
Orissa	59,869	14·6
Punjab (I)	37,428	12·6
Uttar Pradesh	112,523	63·2
West Bengal	29,476	24·7
Hyderabad	82,313	18·6
Kashmir-Jammu	82,528	4·0
Madhya Bharat	46,710	7·9
Mysore	29,458	9·0
Pepsu	10,099	3·4
Rajasthan	128,424	15·2
Saurastra	21,062	4·1
Travancore-Cochin	9,155	9·2
Ajmere	2,425	0·7
Bhopal	6,921	0·8
Bilaspur	453	0·1
Coorg	1,593	0·2
Delhi	574	1·7
Himachal Pradesh	10,600	1·0
Kutch	8,461	0·6
Manipur	8,620	0·6
Tripura	4,049	0·6
Vindhya Pradesh	24,600	3·6
Andaman	3,143	0·03
Sikkim	2,745	0·1
	1,138,814	357·0

India is one of the most densely populated parts of the world, containing as she does nearly one-fifth of the world's total population. The population of Indian Republic is 356,829,485 according to the census of 1951.

In proportion to the area of the country and specially the area available for cultivation, the density of population per square mile in India is amongst the highest in the world. The arithmetic density of population in the country is about 217 per square mile. This *man-land* ratio does not give an accurate measure of real density. Equal areas vary greatly in their capacities and resources for supporting population. The index of population density can be accurate if it can be shown *per square mile of productive land of an area.* The productivity of land depends on climate, soil, configuration, vegetation and mineral resources. The density of population can also be measured in terms of arable land which is known as *physiological density.* In India the density of population per square mile of arable land is about 500.

A noticeable feature in connection with the population in India is the rapid growth of its numbers. The annual increase of population in the country is about 1 per cent. If this rate of growth keeps up, every year there will be an additional 3 million people.

The density of population depends largely on the external environment of a region. Climate, soil, natural resources, topography etc., largely determine the number of people a given territory can support. In India the density of population generally varies with the amount of rainfall. Population is thick in those places where the rainfall is not only heavy but certain as well. West Bengal, Bihar, the U. P. and Orissa are densely populated, because they possess fertile soil, level land and rainfall sufficient for the development of agriculture. But unhealthy regions like the *Sundarbans* in the Lower Gangetic delta cannot attract people although these regions receive heavy rain. There are areas in India where rainfall, though scanty, supports a large population with the help of irrigation. The western parts of the U. P. have been developed by irrigation.

Mountains cannot attract people for settlement. Land is limited for cultivation, and roads and railways are very difficult to construct ; rivers are swift-flowing and are, therefore, useless for navigation. Kashmir and Nepal are mountainous and have a low density of population.

The density of population is also determined by the economic progress of a country. In Europe and North America, the density of population is great in urban and suburban districts and is usually a sign of progress made in mining or industrial or commercial occupations. In India nearly 90 per cent. of the total population is, in the main, village-dwelling. This is because agriculture is the mainstay of the great majority of the people. Eastern Punjab, the Upper Ganges basin, the Lower Ganges basin, the Eastern marginal plain, the Western marginal plain and the South Eastern plain are the most densely populated parts of India. In all these areas agriculture occupies a preponderant position.

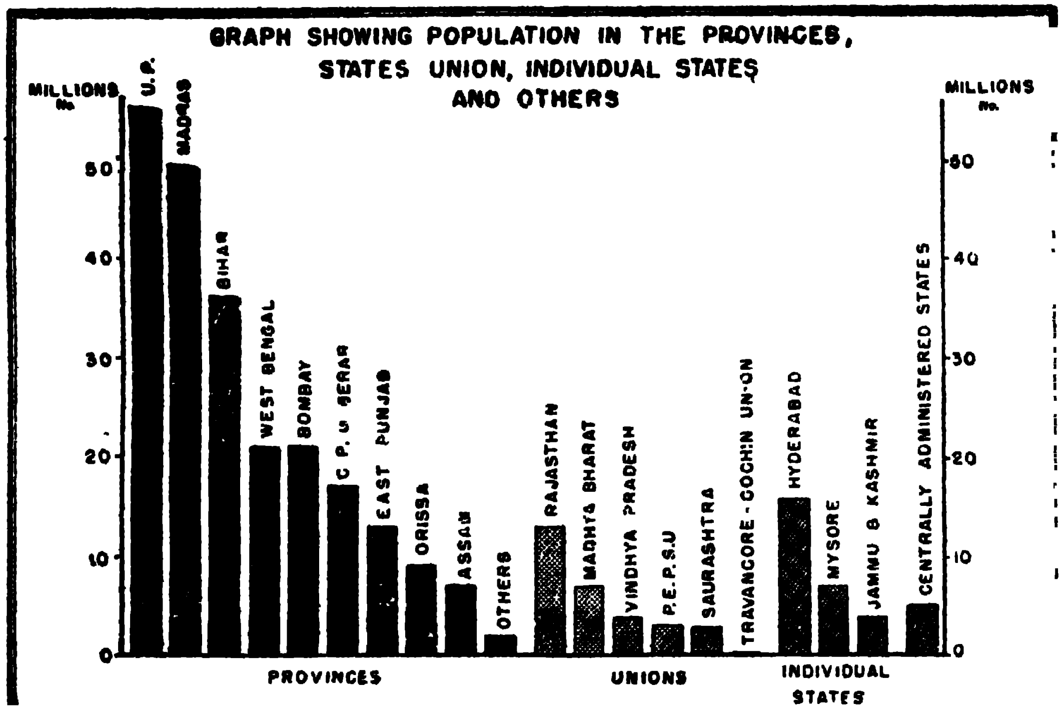

FIG. No. 92.

Between 1931 and 1941 there has been an increase of 50 million people in India. This rapid growth of numbers has created a difficult situation because production has not been able to keep pace with the increase of population. India is now faced with the problem of over-population that stands in the way of national development.

The problem of increased and increasing population in industrial countries is solved by a readjustment of population in the different areas of the same country, reclamation of wastelands, better utilization of economic resources, growth of manufactures, expansion of foreign trade as well as by emigration.

In India there are always some shifts of population from agriculturally congested areas to industrial areas. Every year Bihar, Orissa, Uttar Pradesh and Madras send out a large number of persons to other States where they are employed in factories, plantations and mines. Assam, Bombay, West Bengal, and Madhya Pradesh receive the majority of these emigrants.

MOVEMENT OF POPULATION*

(1931)

States or Provinces which send out emigrants	Gain or loss per 1000 of the population
Bihar and Orissa	−37
United Provinces (Now Uttar Pradesh) ..	−21
Madras	−20
Assam	+144
Bombay	+ 18
Bengal	+ 26
Central Provinces (Now Madhya Pradesh)	+ 13

A large number of emigrants from Bihar, Orissa, the Uttar Pradesh, Madhya Pradesh and Nepal have settled in West Bengal. Of the total immigrants who have settled in West Bengal from other provinces, about 60 per cent. is from Bihar and Orissa and 18 per cent. from Uttar Pradesh. These people are mostly employed in the mills and factories of the Hooghly basin and in the tea-plantations of the Darjeeling district.

Tea-plantations and large tracts of cultivable lands of Assam have attracted many immigrants there and today these people form about one-fourth of the total population of the province. For tea-plantations the recruiting grounds are Bihar, Orissa, Madhya Pradesh and Madras. In the pre-partition days, many peasants from Mymensingh and Comilla (now in Pakistan) migrated to Assam and settled in Nowgong district. Although

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* R. Mukherjee : *"Food Planning for 400 millions."*

Assam is a big State and contains comparatively a sparse population in relation to many other States in India much of the area is covered by forests and hills. About 39 per cent. of the area is forested. Besides, some of the areas are highly malarious. Until all such areas are properly reclaimed, Assam in its present stage of economic development may not encourage immigration of persons from other States.

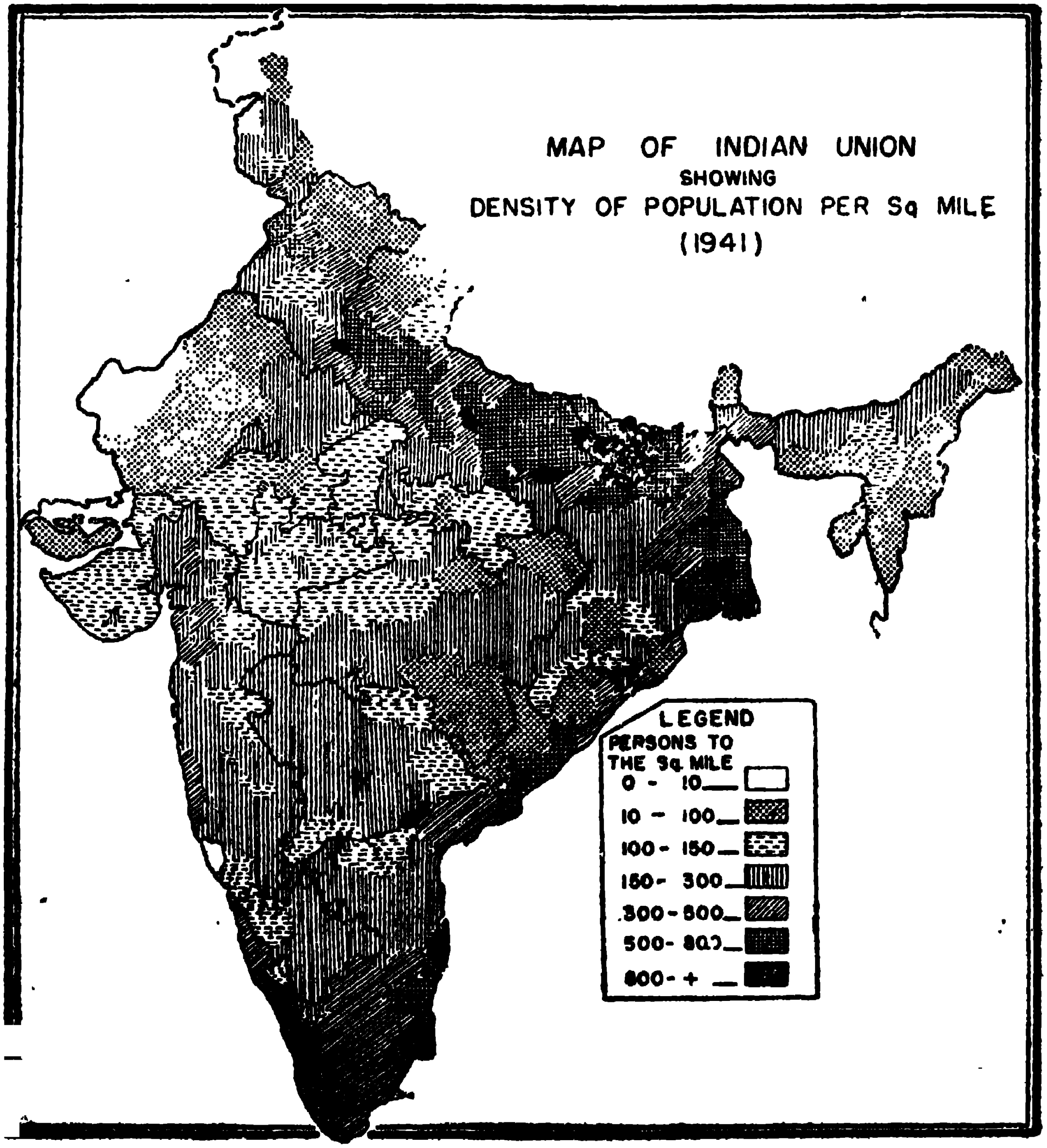

FIG. No. 93. The density of population in Undivided India. Notice the great density of population in the Ganges valley and Travancore.

It is very difficult to say how far the problem of over-population in India can be solved by encouraging emigration of

Indians to other countries. Emigration outside India as a measure of population relief is after all a matter dependent entirely on the attitude of the countries that could absorb such surplus. At present above four million Indians live outside India, of whom 186,000 are in the non-Empire countries. Nearly 75 per cent. of the Indian emigrants live in Burma, Ceylon and Malaya. The majority of them are employed as labourers on sugar and rubber plantations and in mining. In periods of agricultural depression generally the number of emigrants necessarily increases. According to the 1931 census the Indian population in Burma was a little above one million or 6·9 per cent. of the total population of Burma. Recently the competition between Indian and Burmese labour in ports and dock-yards as well as on rubber plantations has increased so much that there is already an anti-Indian feeling in that country. The Baxter Commission was appointed to study the whole question of immigration. Since 1941 Indian immigration into Burma has become subject to regulation and restriction.

Ceylon has nearly 28 per cent. of the total Indian emigrants, forming, as it does, about one-seventh of the total population of Ceylon. They are mostly engaged on the tea and rubber plantations. The emigration of Indian labour to Ceylon has declined in recent years because of low wages offered to the Indians. There is also a growing opposition against the settlement of Indians in Ceylon. Malaya contains 15 per cent. of the Indian emigrants whom it engages in mines and plantations. Before the outbreak of the Second World War, Malaya protested vigorously against the immigration of Indians. Besides, it appears that both Ceylon and Malaya have reached the saturation point and cannot absorb any more Indian labour.

Nor is the position of the Indian labour better in Australia and South Africa. In the early stages of its economic development, South Africa had to invite Indian labour for work on railway construction and in mines. In South Africa, there are 220,000 Indians (the great majority of whom were born in that country) consisting of labourers, traders and professional people. The South African Government now does not want Indian immigrants because of the problem of competition with white men for land and employment. The white settlers of South Africa find that the Indians are ready for and eager to do their work at far lower rates of pay. The present policy of the South African

Government is, therefore, to curtail civic rights of the Indian immigrants, "restrict their opportunities of acquiring land outside well-defined areas, and limit their choice of employment for the sake of saving 'white South Africa'."

Australia has an area of 3,000,000 square miles with a population of hardly 7 million, the bulk of which lives in a narrow belt running from a little north of Sydney round the coast of Adelaide and in the south-west corner. The density of population is nowhere high. There is opportunity, therefore, for the

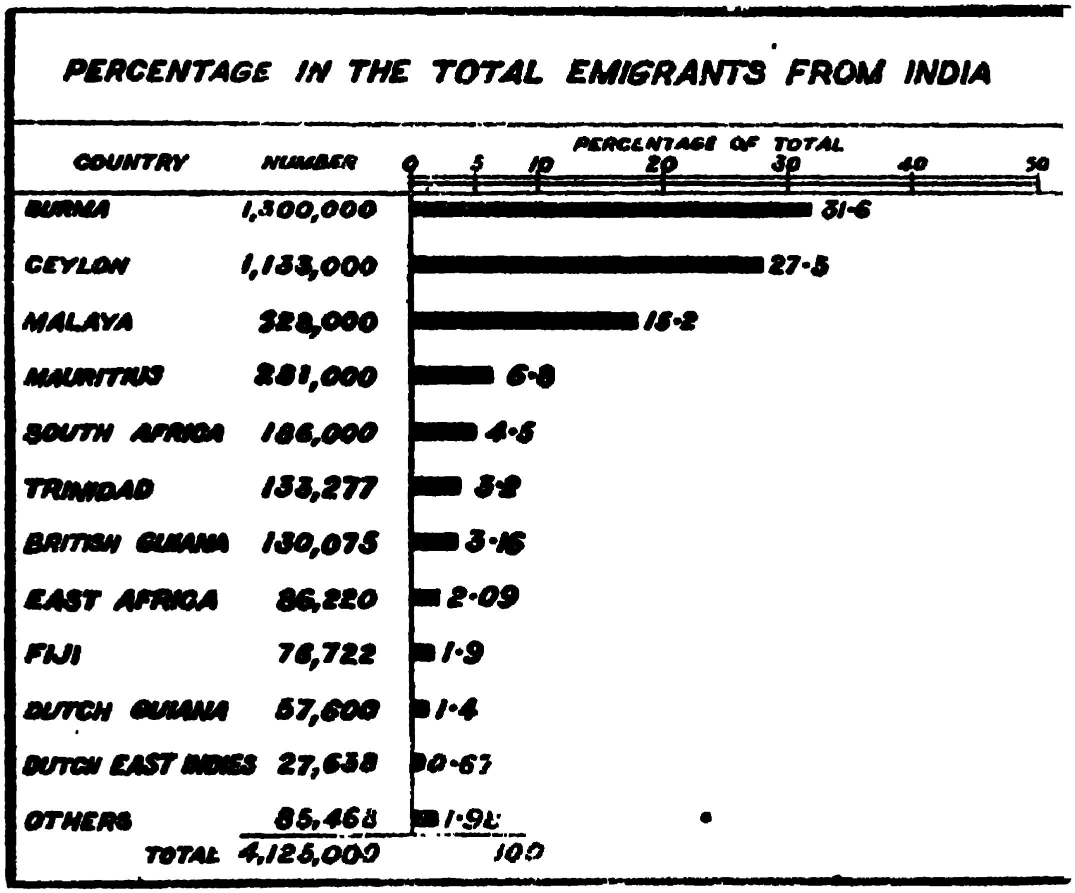

FIG. No. 94. The table refers to 1938-39 position. About 60 per cent. of the emigrants were in Burma and Ceylon.

population to increase many times its present figure. Indeed, the lack of labour is a handicap to the development of Australian industries. The Australian Government has, however, put restrictions on the immigration of Asians on economic ground.

This policy of discrimination in South Africa and Australia acts as a menace to the continuance of feelings of amity and harmony between members of the same Commonwealth. In the Commonwealth and Empire six of every seven persons are nonwhites, and therefore, it is desirable that this problem should be faced and solved by honest efforts.

Many of the Indian emigrants are now returning to India. Between 1931 and 1939 about 900,000 emigrants returned to India as against 300,000 who left India during the same period.

It is evident from an examination of these facts that the problem of population in India cannot be solved by emigration to foreign lands. The measures should include lower birth rate in addition to reclamation of wasteland, agricultural colonization of undeveloped lands and further progress in industrialization. Reclamation of land in Madhya Bharat, Madhya Pardeṣh and Orissa will help settlement of people and extension of agriculture. A re-adjustment of population in the States may also be possible to remove the present disparity.

Races

India is the only country in the world which contains a great diversity of races at every stage of civilization. It is because various races came from outside from time to time and settled in India.

(*i*) The *Negroid* or *Negrito* race was the oldest to settle in India from Africa. This has now almost disappeared on the Indian mainland, but traces have been found in the Rajmahal Hills. The Andamanese belong to the Negrito race.

(*ii*) Next came the ***Proto-Australoids*** from Palestine. They were long-headed, dark-skinned and snub-nosed. The aboriginals of Central India, Madhya Pradesh and Ceylon belong to this race. These people are the genuine and real ancient Indians. They are named Proto-Australoids because if we compare them with 'the aborigines' of Australia we find that in the shape of the head and face, the form of hair and skin colour, they are essentially alike.

(*iii*) The *Austrics,* a branch of the Mediterranean race, came through Mesopotamia in pre-historic times. They were long-headed, comparatively fair, and straight-nosed. They settled in North India. Later they migrated to Burma, Indo-China, Malaya and Indonesia. They are found today in the hills and jungles of Central and North-Eastern India, and they form about 1·3 per cent. of the total population of India. The Kols, Santhals, Khasis, Nicobarese belong to this race.

(*iv*) The *Dravidians* came to India before 3,500 B.C. from the Aegean Islands and Asia Minor. These people were highly civilised and built many cities in Sind and the Punjab. As they migrated towards the south and the Gangetic plain, they came in touch with the Austrics and absorbed a large amount of their blood. "They with the Austrics supplied some of the fundamental bases of Hindu religion and civilization." At the present day, the Dravidians live mostly in Peninsular India and form 20 per cent. of the Indian people.

(*v*) Next came the *Aryans* from the Northern Mesopotamian regions about 2,500 B.C. *via* Iran. They had white skin, finely-cut noses and were tall. Today they account for 73 per cent. of the population of India and occupy chiefly the East Punjab, Kashmir, Rajputana and Western U. P.

(*vi*) The *Mongoloid* race came after the Aryans. "They appear to have spread from their primitive home in North-Western China about the middle of the first millenium B.C. into Tibet, and in the subsequent centuries they penetrated through the Himalayas and through Assam into the Himalayan regions and the plains of North and East Bengal and the hills and the plains of Assam." These people occupy Nepal, Tibet, parts of Eastern Kashmir and Assam. They have yellow skin.

There has been great intermixture, and pure racial characteristics are hardly to be found. The *Aryo-Dravidians* are a mixed race of Aryans and Dravidians. They occupy the Uttar Pradesh, Bihar, Central India, Bombay, M. P. and parts of Western Bengal. The *Mongolo-Dravidians* are a mixed race of Mongols and Dravidians. They occupy the eastern parts of Bengal and Assam. They have dark complexion, medium height and broad noses. The *Scytho-Dravidians* are a mixed race of Scythians and Dravidians. They are found in Gujrat and Western Deccan. The Mahrattas are of this type.

Languages

India is a land of many languages. According to the Linguistic Survey of India, there are 179 languages of which 116 are current among less than one per cent. of the entire population of the country. When we take into consideration the language of the large, advanced and organised communities, we find only 14 major languages in India. These languages are: (1) Hindi; (2) Urdu; (3) Bengali; (4) Oriya; (5) Marathi; (6) Gujerati; (7) Kashmiri; (8) Punjabi; (9) Nepali; (10) Assamese; (11) Telegu; (12) Kannada; (13) Tamil and (14) Malayalam. Punjabi and Nepali agree very closely with Hindi, while Oriya and Assamese are very much like Bengali. The last four are the languages of the South. The first ten languages are spoken by 230 million people and the last four by 66 million in the Indian Union.

The multiplicity of languages is no bar to nationhood. Some of the important States like Canada, South Africa, Spain, Czechoslovakia, Switzerland, China, Soviet Russia, the States of South America and Belgium have many languages, some of them having two or three court languages.

Too much emphasis, therefore, need not be given to the problem of languages in India. One can travel throughout Northern India and a good part of the Deccan also with a little knowledge of Hindi.

Both Hindi and Urdu are identical in points of grammar and syntax and can be regarded as really one speech, split into two, by two totally different scripts. Hindi is written in Devnagri script while Urdu in Persian-Arabic script. During the Moghal period when the Persian and Turkish-speaking Mohammedans met the Hindus in mart, in camp or in the battlefield, the former in order to make themselves understood had to use a mixed dialect, as they had naturalised some words of the language of the Hindus. The Hindus, on the other hand, had adopted some of the expressions of the Mohammedans.

Hindi has been declared as the official language of the country. English, however, will continue to be used for all official purposes for a further period of 15 years.

AGRICULTURAL PRODUCTION

Of the total area of the Indian Republic, the total land available for cultivation is about 358 million acres. Taking the total population of India at 357 million, the land available for cultivation *per capita* of population comes to 1·06 acres. The diagram below shows the present position of the country in respect of her land and its utilization.*

India is essentially an agricultural country where nearly 70 per cent. of the total population depend directly and another 20 per cent. indirectly for their sustenance upon land. Thus agriculture is the single largest industry in India and it provides not only all the food grains and raw materials for inland con-

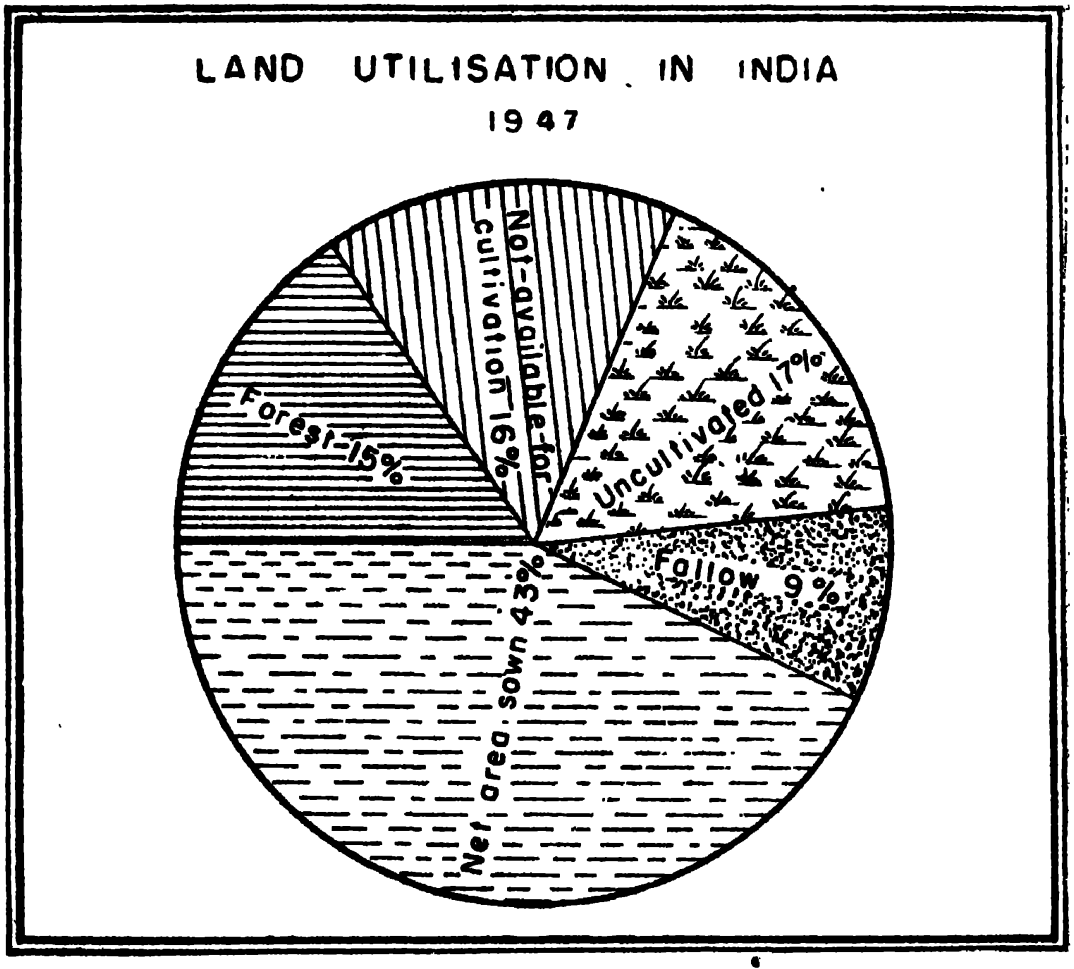

FIG. No. 95.

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* Geographical, economic and cultural factors control land utilization. The geographical factors are rainfall, temperature, soil and relief which influence plant life. The economic factors are connected with transportation, density of population and the size of the market that can be supplied from a given area. The cultural factors include the stage of agricultural and industrial development, local prejudices, the system of land tenure and the Government policy.

The Indian Republic has 911·68 million acres of land of which *uncultivable area* covers 173·37 million acres.

sumption but also for export. As a matter of fact, India occupies a very important place in world trade as a supplier primarily of raw materials. *She is, to-day, the largest sugar-cane producing country in the world. In the production of rice, millets, tea, groundnut and linseed, her position is equally important. She holds a virtual monopoly in lac, follows the U.S.A. in cotton and Argentina in linseed, ranks with China and Africa as one of the chief millet-producing areas, and leads with China in the production of rice and tea.*

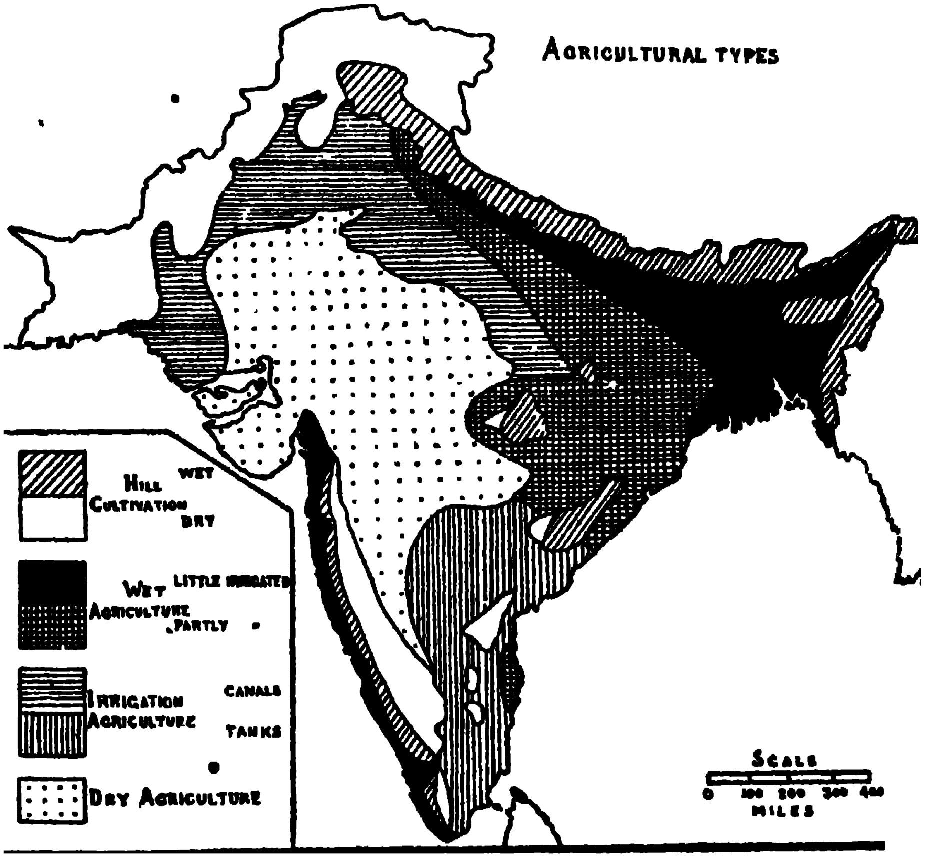

FIG. No. 96. More than 35 per cent. of the total area of Undivided India is actually under cultivation. Wet agriculture is practised in the Ganges Valley and the Western Coastal Strip.

Agricultural operations in India begin in June with the arrival of the monsoon. The crops thus raised in autumn as a result of the sowings made in June are known as the *Kharif* crops. The principal Kharif crops are wheat, rice, millets, maize and cotton. Another agricultural season commences in winter, the *products* of which are known as the *Rabi* crops. The principal

Rabi crops are wheat, barley, gram, linseed, rape seed and mustard.

There are mainly four types of agriculture in India, *e.g.*, hill cultivation, wet agriculture, irrigation agriculture and dry agriculture. The variations are due to her topography, climate, soil and the type of population.

Cultivation is mostly confined to Madras, Bombay, West Bengal, the U. P., the East Punjab, Bihar, Orissa and the M.P. The areas where the cultivation of land is difficult are: (*a*) Eastern Bombay and the M.P.—high lands are generally infertile soil, excepting the black soil ; (*b*) Assam—unhealthy climate in several districts as well as dense forests and mountains restrict cultivation to definite areas : (*c*) Rajasthan, an arid region where cultivation is extremely difficult ; (*d*) the Himalayas where mountains prevent large-scale cultivation ; (*e*) M.P. and Orissa border where malaria is highly prevalent. All the same, cultivation of land in these five areas is carried on in places which offer better conditions.

The study of agricultural crops in India reveals that agriculture is a very old industry and the cultivators are intelligent and hard-working—though illiterate and poor. But there are great differences in the agricultural conditions and practices that prevail in different parts of the country, which are due, in no small measure, to the differences in soil, climate, rainfall and methods of cultivation.

YIELD PER ACRE IN LBS.

	Rice	Wheat	Linseed
Bengal	866	660	416
U. P.	645	725	359
Bihar	756	865	307
M. P.	705	429	180
Bombay	871	393	—

Another problem is that the *agricultural productivity of India is lower than that of the other important agricultural countries of the world.*

QUINQUENNIAL AVERAGE (1932-36) IN QUINTALS PER HECTARE

Crop	China	Japan	France	Italy	U.S.S.R.	U.S.A.	India
Rice ...	25·6	36·0	...	...	...	...	13·7
Wheat ...	11·1	13·8	15·9	14·3	7·8	8·3	7·0
Barley ...	12·1	20·4	14·6	10·6	8·9	10·5	9·4
Maize ...	13·7	13·8	14·4	19·6	10·1	13·2	8·7
Cotton ...	22·4	...	...	...	2·4	2·1	0·9
Linseed ...	...	...	4·6	5·9	2·8	3·5	2·7
Groundnut ...	12·2	21·5	...	...	...	7·9	10·0

This low productivity of land in India is due to the differences in agricultural methods and in the stages of development in the economic life of these countries.

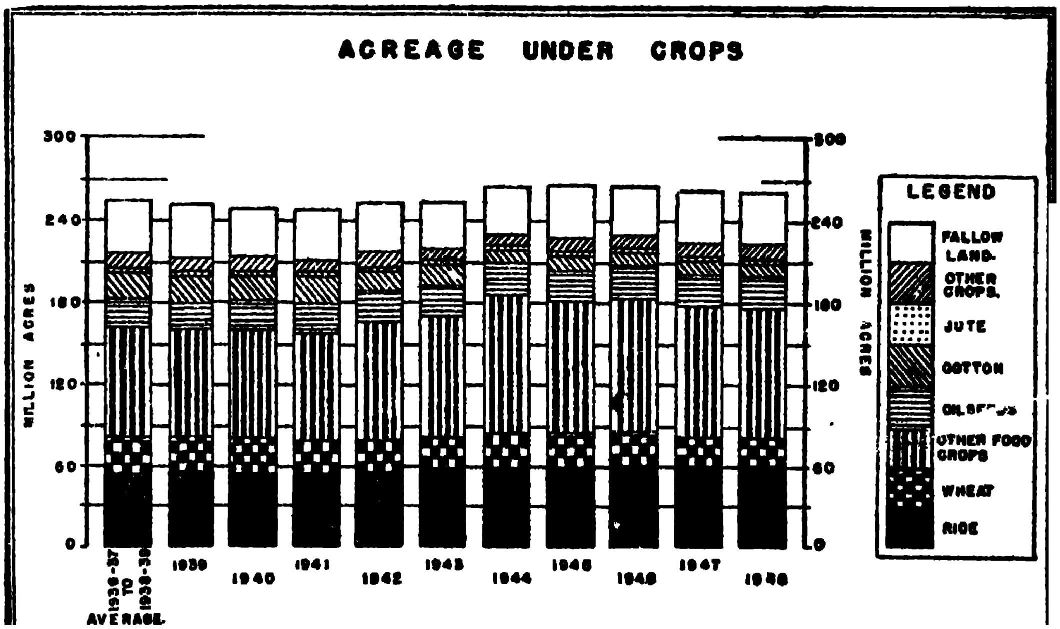

FIG. NO. 97.

The third problem is the *maladjustment of food resources to the growing population of India*. The pre-war production of food-grains in India, even when supplemented by imports, fell short of the actual requirements of the country. In normal times there has always been a food deficiency for about 12 per cent. of the population in a year.

The outbreak of the War in 1939 brought about great expansion in the cultivation of various crops. The expansion, however, did not take place in the right direction. Our food resources, for example, have not kept pace with the increase of population. Secondly, the agricultural resources were mostly exploited in the interest of the Empire. With the attainment of freedom, however, India has directed her agricultural expansion to meet the needs of the people in the shape of food and primary products.

AREA AND YIELD OF PRINCIPAL CROPS IN THE INDIAN REPUBLIC

A. *Food and Beverage*

	1950-51		1951-52	
	Area (in 000 acres)	Yield	Area (in 000 acres)	Yield
Rice (yield in 000 tons)	75,414	23,170	75,458	20,389
Wheat (yield in 000 tons)	24,114	6,290	23,983	6,590
Other cereals* (yield in 000 tons) ..	95,969	16,558	93,662	14,744
Gram (in 000 tons) ..	20,497	3,677	19,387	3,766
Groundnut (000 tons) ..	9,832	3,379	10,472	3,331
Sugarcane (Raw Sugar in 000 tons) ..	3,624	4,938	4,138	5,462
Tea (yield in million lbs.) ..	771	585		
Coffee (in million lbs.)	218	35	218	45
	230,439		227,318	

B. *Non-Food*

	1950-51		1951-52	
	Area (000 acres)	Yield	Area (000 acres)	Yield
Cotton (yield 000 bales)	12,173	2,628	13,859	2,926
Jute (000 bales of 400 lbs.) ..	1,454	3,301	1,951	4,678
Other oilseeds† (000 tons)	15,053	1,763	15,508	1,738
Tobacco (000 tons) ..	860	264	839	251
Rubber ..	170	35		
	29,710		32,157	

Thus, food crops occupy about 86 per cent. of the total acreage under crops in the Union.

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* Jowar, bajra, maize, barley, ragi and small millets.

† Linseed, rape and mustard, sesamum and castor seed.

INDIA AND HER FOOD SUPPLY

Although India is one of the greatest agricultural countries of the world, her position with regard to food production is not at all satisfactory. The production of cereals in the Indian Union is at present about 43 million tons a year, which is just sufficient for six-sevenths of her present population. Moreover, the population of India is growing at the rate of one per cent. a year. At this rate India needs additional food of half a million tons of cereals every year. The total consumption on the basis of 16 ounces for the farming population and 12 ounces for others is estimated at 43·6 million tons. To this must be added about 5 million tons for seed and wastage. Before the World War II, the deficit could be made up by imports of rice from Burma and Thailand. These countries have now a very small exportable surplus because of political disturbances. West Punjab and Sind used to supply a considerable quantity of wheat. Now that the country is partitioned, India is deprived of nearly a million tons of wheat from Sind and West Punjab. Thus the shortage of food in India today is to the extent of 4 million tons a year.

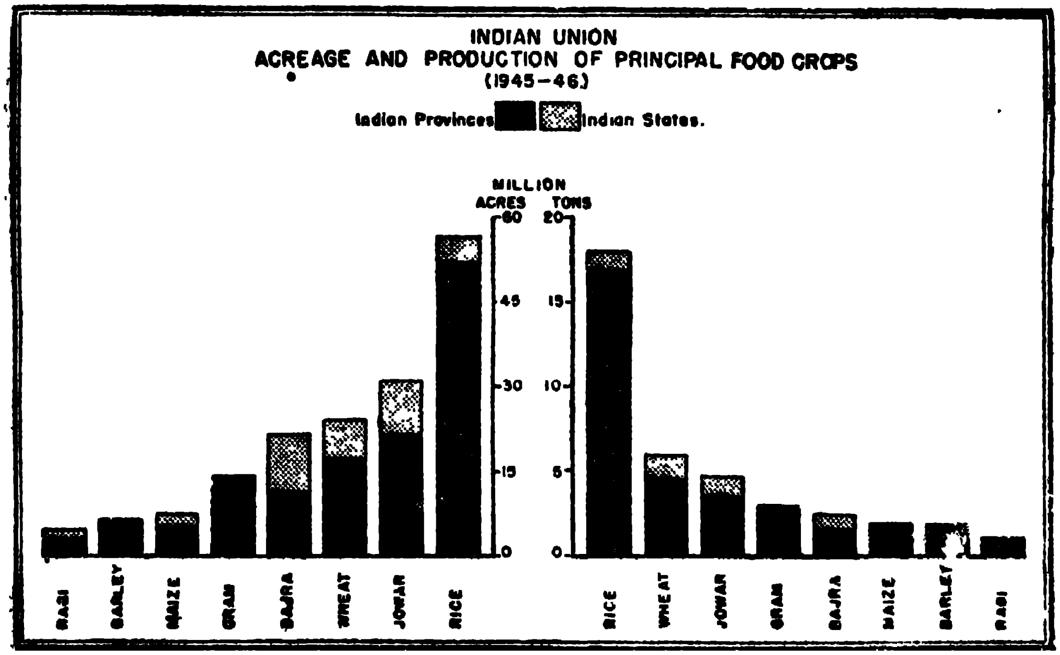

FIG. No. 98. Note the greater acreage under jowar and bajra in the States. Gram is an exclusive product of the provinces. Data from '*Agricultural Situation in India*', 1948 issued by the Ministry of Agriculture.

India has to import food from Burma, China, Russia, U.S.A., Pakistan and other countries.

IMPORT OF FOOD INTO INDIA

Year	Million tons	Value in crores of rupees
1947	2·33	93·76
1948	2·84	129·59
1949	3·80	142·00
1952	4·76	228·11

Of India's total import of food in 1951, wheat accounted for 2·96 million tons, rice 748,550 tons, milo 949,162 tons, flour 45,299 tons and sorghum 11,791 tons. The deficit of cereal production is about 10 per cent. of the present production. This deficit can be made up by reclamation of wasteland, increased supply of water through irrigation, use of good seed, use of chemical manures, use of machinery to bring new or difficult land under cultivation and by anti-malarial measures to improve the health of peasants.[*] India has several million acres of cultivable wasteland infested by mosquitoes and malaria. It is possible to make these areas agriculturally fit and malaria-free. Rice-growing areas in India are coincident with endemic malarial tracts. There are several tracts in India which are very fertile but have remained mostly uncultivated because of the hyper-endemic malarial conditions. Such tracts are (*a*) a horizontal strip of Sub-Himalayan tract—*terrai*, (*b*) a vertical strip along the Western Ghats and (*c*) a strip along the Eastern Ghats enlarging into a wide belt at the top merging into Madras, Orissa, Madhya Pradesh and Hyderabad. In all these areas, rice cultivation may be very profitable as the rainfall is between 50″-100″ per year. Malaria affects man but not the soil. Mosquitoes and rice plants are both sub-aquatic—one is aquatic fauna and the other is aquatic flora. They grow under the same conditions of high temperature, high humidity and heavy rainfall. It is possible to control mosquitoes and suppress malaria and to grow more rice to feed the country. Thus, as a short-term programme, efforts should be made to increase the production of rice by controlling malaria.

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[*] The following four-point programme of agricultural development for India has been recommended by Mr. N. C. Dodd, Director General of F. A. O. of U. N.: (*a*) Control of soil erosion by strict limitation of forest cutting, (*b*) extension of tube-well irrigation, (*c*) greater use of clover crops for their nitrogen-restoring and water-holding properties rather than the extensive use of artificial fertilisers, and (*d*) limiting mechanisation to the breaking of new land and terracing to avoid soil erosion. Total mechanisation of Indian farming would be unwise as that would disturb the long-established agricultural practices.

The whole of the country in the south between the Ghats and the sea-coast from Goa to Cannanore can also be developed to yield food crops. This region is known as *Malnad*. The chief characteristics of the region are the following: (*a*) the rainfall is invariably over 60 inches ; (*b*) the area is full of evergreen forests, (*c*) the density of population is below the average of 200 to 300 per square mile. The chief crops are paddy, betel nut, cardamom, pepper and coffee. In spite of the great geographical advantages of the Malnad area, it is at present in a backward position. The reasons are many ; such as excessive rainfall, unhealthy climate, prevalence of malaria, inadequacy of communication and scarcity of labour. If these problems are solved, Malnad will contribute substantially towards the production of food grains in the country. The use of heavy tractors will enable the now inaccessible lands to be brought under cultivation.

The Government of India proposes to bring 6·2 million acres of potential wheat-growing land under cultivation.

Provinces and States	In million acres	Provinces and States	In million acres
Madhya Bharat ..	1·4	Bhopal	·5
Uttar Pradesh ..	1·0	Vindhya Pradesh ..	·5
Madhya Pradesh ..	·9	East Punjab States ..	·4
Bombay	·5		
Orissa	·5	Total ..	6·2
East Punjab	·5		

It is also necessary to pay more attention to subsidiary foods like bananas, tapioca and sweet potatoes. The Government of India has set up a *Subsidiary Food Production Committee* for the purpose. The Committee recommends increased production of sweet potatoes, tapioca, and the utilization of groundnut cakes. The 3½ million tons of groundnut produced in India can yield 2 million tons of finest food equivalent in protein value to over 2,400 million gallons of milk. Tapioca as a staple diet is unsatisfactory because of a deficiency in the quantity and possibly the quality of its proteins. The present tendency in certain parts of India to foster consumption of tapioca at the expense of that of other foods, such as rice, is undesirable from the standpoint of nutrition.

The Indian Council of Medical Research has started researches on all aspects of the problem of including tapioca in Indian diets. Analysis shows that tapioca contains only ·07% protein against 6·4% in rice, 12·1% in whole wheat flour, 11·6% in bajra, 11·5% in barley and 11·1% in maize. Tapioca is also poor in carbohydrates and fats.

COMPARATIVE FIGURES

Here are the comparative figures :

	Carbohydrates	Fats
Tapioca	38·7	0·2
Rice	79·1	0·4
Whole wheat flour (atta) ..	72·2	1·7
Bajra	67·1	5·0
Barley	69·3	1·3

Medical reports on tapioca must be discouraging to those who have fostered its growth as a subsidiary food. The total acreage under tapioca is about 634,000 acres of which 582,000 acres are in Travancore-Cochin and the rest in Madras.

Tapioca's popularity appears to be based on its high yield, about three to five tons per acre which with careful cultivation can be raised to 15 tons per acre. It can thrive in relative dry weather.

Attracted by this consideration, Bihar obtained cuttings of tapioca from South India with a view to popularizing its cultivation.

Rice. The first mention of rice in India occurs in the Atharva Veda as early as 1,000 B.C. It is at present the most important crop in India, covering as it does nearly 30 per cent. of India's sown area. India is the second largest rice-producing country in the world.

Rice thrives best in high temperature and abundant moisture and the crop is generally grown in fields susceptible of being

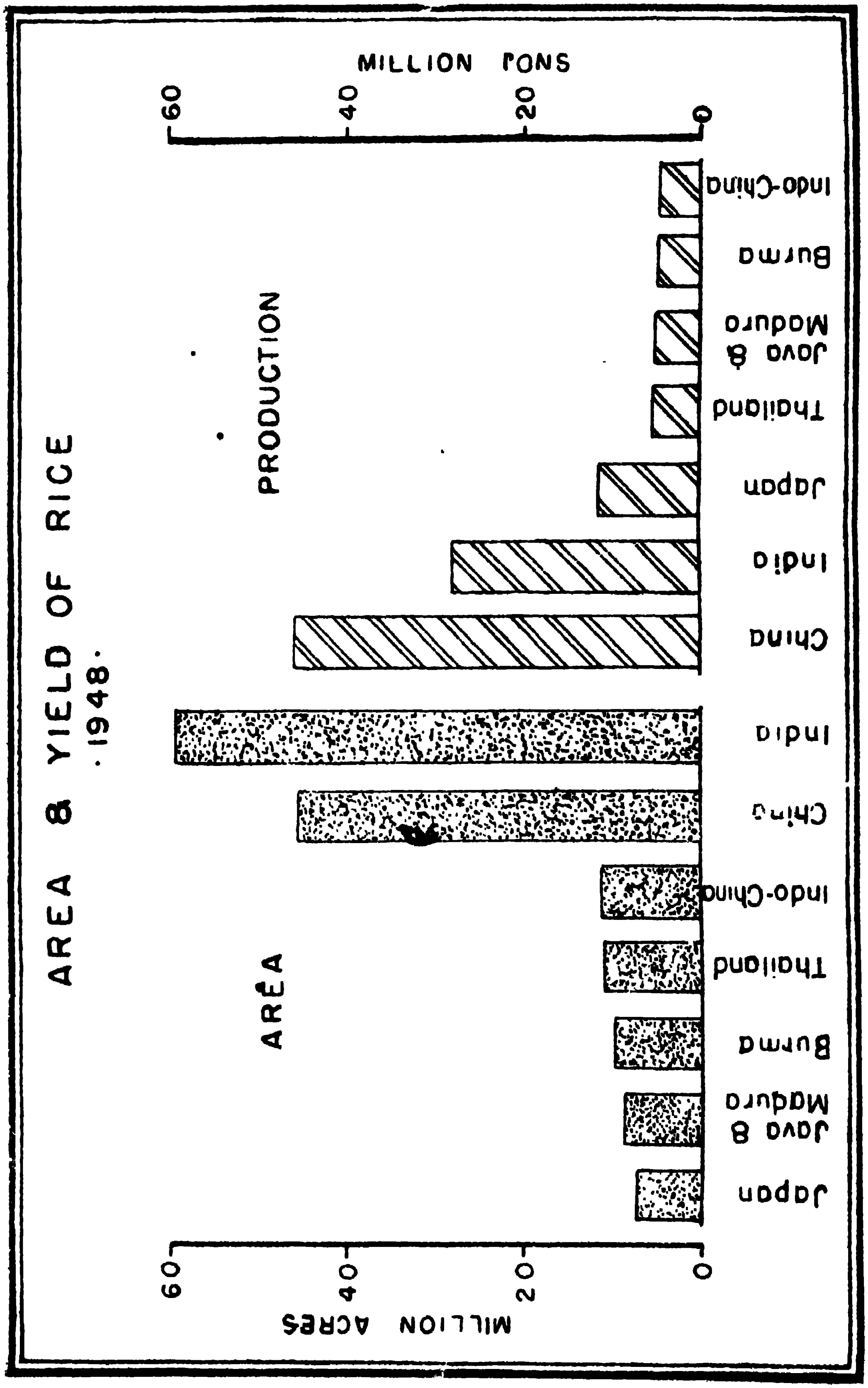
AREA & YIELD OF RICE
· 1948 ·
AREA
PRODUCTION
MILLION ACRES
MILLION TONS
0
20
40
60
Japan
Java & Madura
Burma
Thailand
Indo-China
China
India

Fig. No. 99.

flooded at certain stages of its growth. Hence the greatest areas under rice are found in river deltas, in low-lying coastal districts and in tracts subject to floods during the monsoon. Rice can also be grown in hill-tracts if the supply of water is abundant, and the summer, warm. "For the purposes of cultivation, the hill-sides are cut into terraces which are levelled off and embanked by means of bunds in order to retain the moisture obtained from nearby streams or from rainfall."

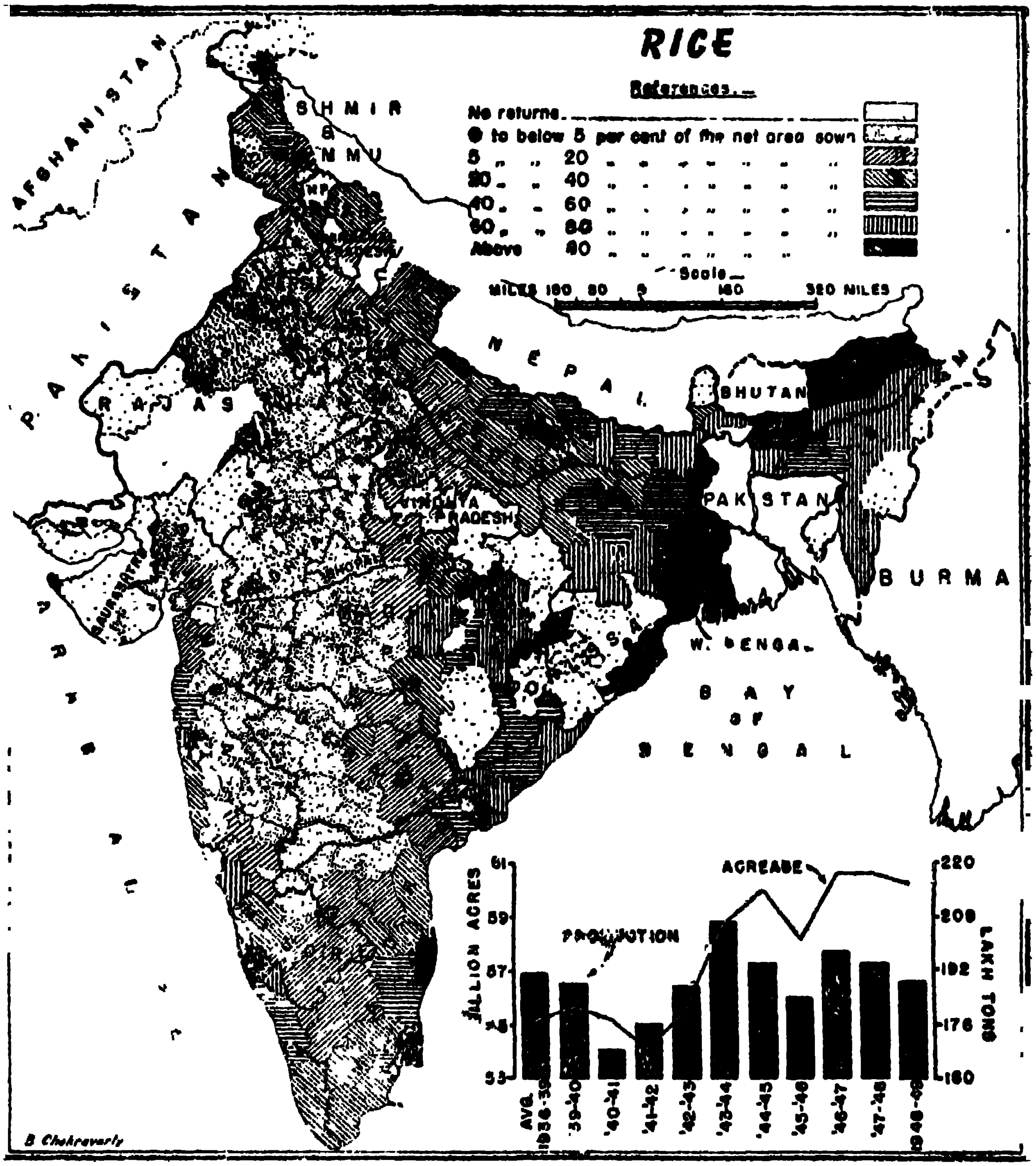

FIG. No. 100. Note that the rice-growing areas are practically confined to the eastern parts of the country.

In Madras, there are three rice crops in the year, known as the *Aus* (autumn), *Aman* (winter) and *Boro* (summer) according to the season in which they are harvested. The winter crop, most important of all, is sown between June and August, and harvested between November and January. The autumn crop is sown in March-July, and harvested in September-October. The summer crop is sown between November and January and harvested in March-May.

In Madhya Pradesh and Madhya Bharat only one rice crop is cultivated. This is sown in May-June and harvested in September-November.

Time of Sowing and Harvesting of Rice in Different Areas of India

Province/ State	Winter Rice		Autumn Rice		Summer Rice	
	Sowing	Harvesting	Sowing	Harvesting	Sowing	Harvesting
Bengal	May-July	Oct.-Jany.	March-July	June-Sept.	Oct.-Jany.	Feb.-April
Bihar	June-August	Nov.-Dec.	May-July	August-Oct.	Sept.-Nov.	Feb.-March
Madras	June-Oct.	Dec.-March	...	...	Dec.-March	April-May
Punjab	March-August	Sept.-Nov.	..	...	...	...
U. P.	June-August	Sept.-Dec.-	...	..	...	...
Coorg	June-July	Dec.-Feb.	...	...	...	...
Baroda	May-August	Dec.-Jeny	...	...	...	...
Kashmir	...	...	April-May	Sept.-Oct.	...	...
Mysore	June-July	Nov.-Dec.	...	...	Feb..	April-May
Bhopal	June-July	Nov.	June-July	Oct.	...	...
Cochin	Sept.-Oct.	Jany.-Feb.	April-May	Sept.-Oct.	Jany.-Feb.	April-May
Rampur	June-July	Oct.-Nov.	...	...	...	...
Hyderabad	June-July	Nov.-Dec.	...	...	Jany.-Nov.	April-May

Rice is sown in India in three ways—by broadcast, by drill and by transplantation from a seed-bed. The first method is practised where labour is scarce and the soil infertile. The second method is mostly confined to Peninsular India. The third method is common but it requires a plentiful supply of labour, because the seed-beds are to be highly manured before the seeds are sown. After four or five weeks, the seedlings are uprooted, tied into bundles and carried to the field where they are again planted by hand. The transplanting of the young plants from seed-beds to fields, cutting the rice with sickle and the husking of the grain—all involve much manual labour.

The monsoon greatly influences rice production in India. Its failure has much adverse effect on the output, because water is the principal factor in its cultivation.

The principal rice-growing areas of India are, in order of importance, Madras, Bihar, West Bengal, Uttar Pradesh, Madhya Pradesh, Orissa, Assam and Bombay.

AREA AND YIELD OF RICE IN INDIAN REPUBLIC (1950-51)

Regions	Area (in 000 acres)	Yield (in 000 tons)
West Bengal ..	9,796	3,910
Bihar ..	14,055	2,562
Madras ..	10,126	4,030
Madhya Pradesh	8,933	1,526
Orissa ..	9,489	2,718
Assam ..	3,712	1,294
U. P. ..	9,335	2,015
Bombay ..	3,000	1,004
ALL TOTAL ..	75,446	20,059

88 per cent. of the rice acreage in India is located in the provincial states and the remaining 12 per cent. in the Indian States.

The yield per acre of rice is influenced by a number of factors, such as rainfall, irrigation and soil, which are liable to vary from place to place. It also varies according to season. Summer rice generally gives the largest yield and autumn, the smallest. The average yield per acre is 862 lbs. and this figure does not compare very unfavourably with those of Indo-China and Thailand, but falls far short of the yields in the U.S.A., Japan, Egypt, and Italy where the yields per acre are 1,485 lbs., 2,454 lbs., 2,030 lbs. and 2,940 lbs. respectively.*

Almost in every district of West Bengal rice accounts for more than 60 per cent. of the sown area. About 9·5 million acres of land are under rice cultivation in West Bengal with approximately 3·7 million tons of rice as annual yield. Other areas where rice crop covers over 80 per cent. of the sown area are Cuttack, Puri and Sambalpur in Orissa; Kamrup and Goalpara in Assam, and West Godavari, Chingleput, Tanjore and Kanara in Madras.

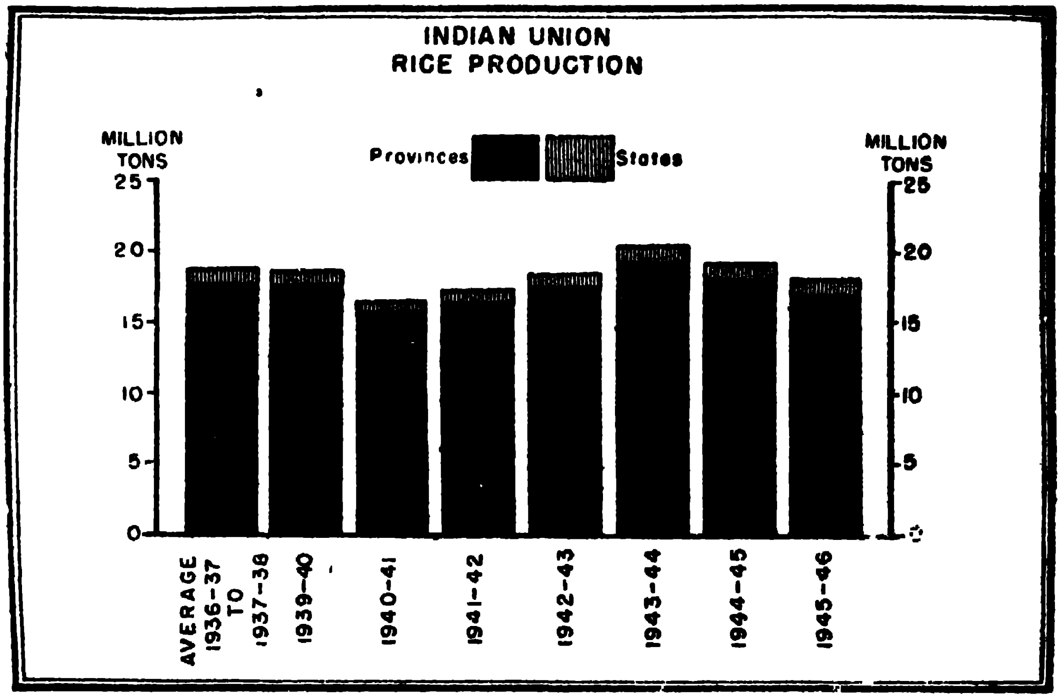

FIG. No. 101. Note the fall in production in 1940-41, and the peak production in 1944.

In spite of her normal production of 18 million tons, India is not self-sufficient in rice, and she has to import considerable quantities of paddy and rice. More than 200 million people of India eat rice and so far India has been unable to produce all the rice needed. Normally, Burma sends 2½ million tons to supplement India's production. In 1951, India imported about 748,500 tons of rice. The bulk of imports is derived from Burma and the rest from China, Thailand, Egypt and Pakistan.*

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* *Rice Economy in Asia* (F.A.O. publication of the United Nations).

West Bengal has a normal deficit of 300,000 tons. Madras, Bihar, Bombay and U. P. have larger deficits but in these provinces, wheat is the staple food crop. Assam, C. P. and Orissa normally have surplus production.

There is a large scope for further cultivation of rice in India, particularly in West Bengal, Bihar and Orissa. The three multi-purpose projects in the Damodar, Koshi and Mahanadi aim at making million of acres of land cultivated. Production of rice can also be increased in the Indian Union by 50 per cent. through intensive cultivation with improved varieties and better manuring.

Wheat has been cultivated in India from time immemorial. Grains unearthed from the 3,000 year-old ruins of Mahenjodaro in the Indus Valley have been identified as *Triticuma Compactum*, a type of wheat cultivated in South-West Punjab.

Wheat is the staple food of the people in East Punjab and Uttar Pradesh. India occupies the third place in the list of wheat-producing countries and produces about one-eighth of the world's total.

Wheat requires a large amount of heat for its grain to ripen ; but the necessary period of heat need not be very long as the grains ripen quickly. At the sowing season, wheat requires water but too heavy rain like that of West Bengal, Assam and Eastern Madras is unfavourable to its cultivation. The plant can endure extreme dryness provided there is provision for minimum of water by rainfall or by means of irrigation. In East Punjab and the Uttar Pradesh, where the rainfall is very small and never exceeds thirty inches per annum, wheat cultivation has become very successful with the help of irrigation.

In India there are two principal varieties of wheat: the *normal bread wheat* and the *macaroni wheat*. The first type grows as an irrigated crop in East Punjab and U. P., while

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* Of the 748,500 tons of rice in 1951, Burma supplied 304,186 tons, Thailand 216,172 tons, Egypt 4,624 tons, China 65,779 tons and Pakistan 15,778 tons.

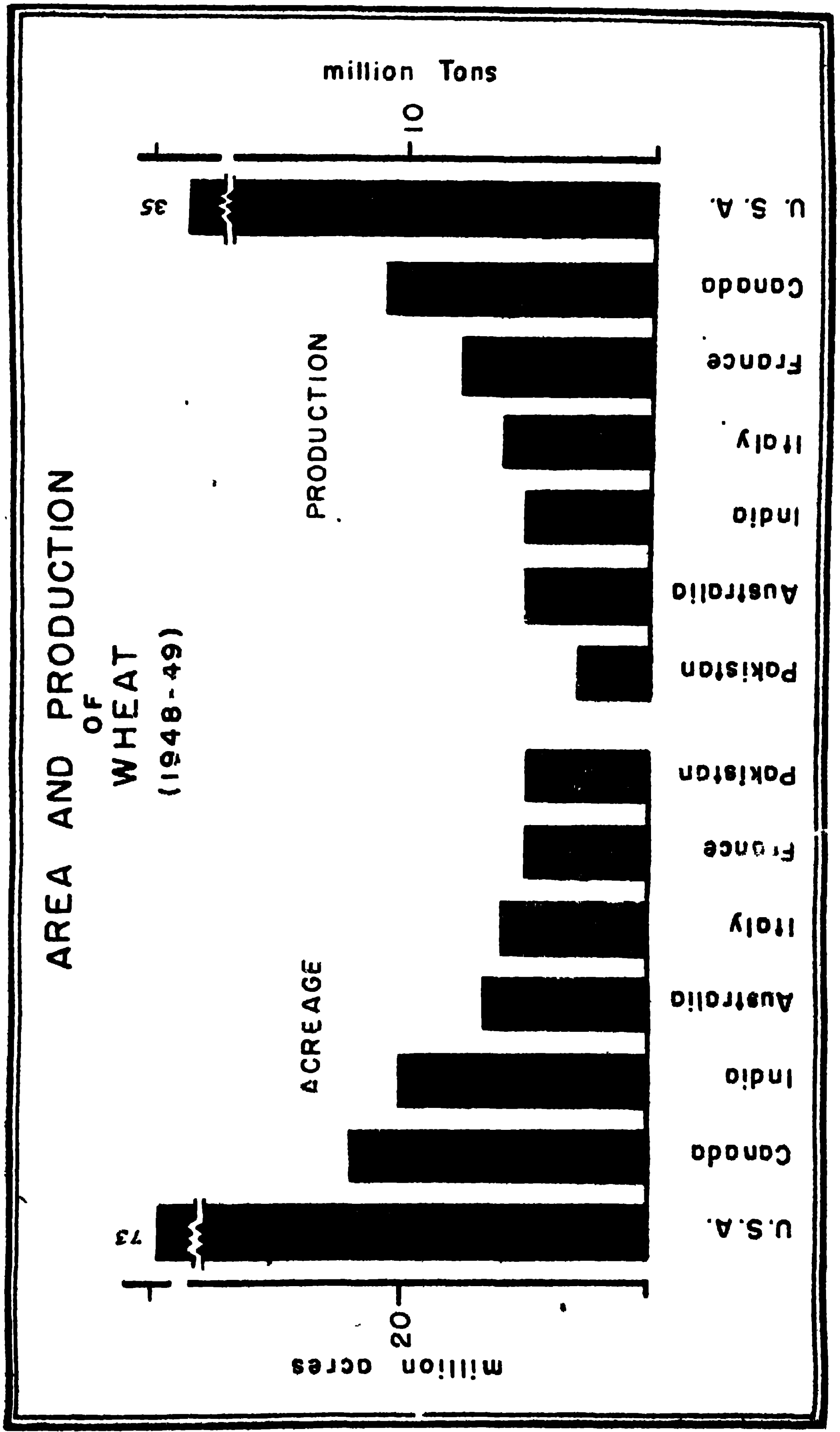
AREA AND PRODUCTION
OF
WHEAT
(1948-49)
million Tons
10
35
PRODUCTION
U. S. A.
Canada
France
Italy
India
Australia
Pakistan
ACREAGE
Pakistan
France
Italy
Australia
India
Canada
U.S.A.
73
20
million acres

FIG. No. 102.

the second type is grown as a rain-fed crop on the clayey black soil of Bombay, M.P. and Hyderabad.

In East Punjab and Western U. P., the bulk of the crop is generally sown by the end of November. In the Uttar Pradesh and Bihar it is generally grown in late October or early November, while in the Deccan and parts of the Bombay Presidency the crop is sown between September and the middle of October.

Generally wheat takes 3 to 6 months to ripen. In the south the growing period is shorter than in the north. The harvesting may begin at the end of December in the south, while in Madhya Pradesh, Madhya Bharat and Vindhya Pradesh, it commences normally in March. In western U. P., Delhi and Eastern Punjab, harvesting is normally in full swing by the end of April.

TIME OF SOWING AND HARVESTING OF WHEAT IN DIFFERENT AREAS IN THE INDIAN UNION

Province/State	Sowing	Harvesting
Ajmer-Merwara	Nov.-Dec.	March-April
Bihar	Oct.-Nov.	March-April
Bombay	Oct.-Nov.	March
C. P. & Berar	Oct.-Nov.	Feb.-March
East Punjab	Oct.-Dec.	March-May
U. P.	October	March-April
West Bengal	Nov.-Dec.	Feb.-April
Baroda	Oct.-Dec.	March-May
Bhopal	Oct.-Nov.	March
Hyderabad	Sept.-Oct.	Feb.-March
Kashmir	Oct.-Nov.	April-May
Mysore	October	February
Rampur	Oct.-Nov.	March-April

WHEAT-PRODUCING AREAS IN INDIAN REPUBLIC

State	Area (acres) 1949-50	(*In thousands*) Yield (tons) 1949-50
Assam	3	1
Bihar	1,133	161
Bombay	1,990	331
Madhya Pradesh	2,503	610
Madras	18	2
Orissa	13	13
Punjab	3,089	1,124
Uttar Pradesh	8,221	2,915
West Bengal	125	41
Hyderabad	454	45
Jammu & Kashmir	158	58
Madhya Bharat	1,975	318
P.E.P.S.U.	824	292
Rajasthan	1,225	241
Saurashtra	209	64
Ajmer	39	8
Bhopal	523	108
Bilaspur	39	3
Coorg	—	
Delhi	56	14
Himachal Pradesh	258	53
Kutch	18	3
Vindhya Pradesh	614	101
TOTAL	23,487	6,496

In 1949-50, the acreage under wheat was 22 million acres in India.

Ploughing and sowing, harvesting and threshing call for a large amount of manual labour and therefore it is cultivated on a large scale in those areas where a large force of labour is available.

India grows less than one acre of wheat for every ten persons. Canada and Australia, on the other hand, have two and a half acres for each member of population. Continental countries, *e.g.*, France and Italy, have one acre of wheat for every three persons, and the United Kingdom has one for four.

Compared with other countries, India's figure is indeed unsatisfactory. The average yield of wheat per acre in India is 636 lbs. The following table shows the average yield of wheat in certain States.

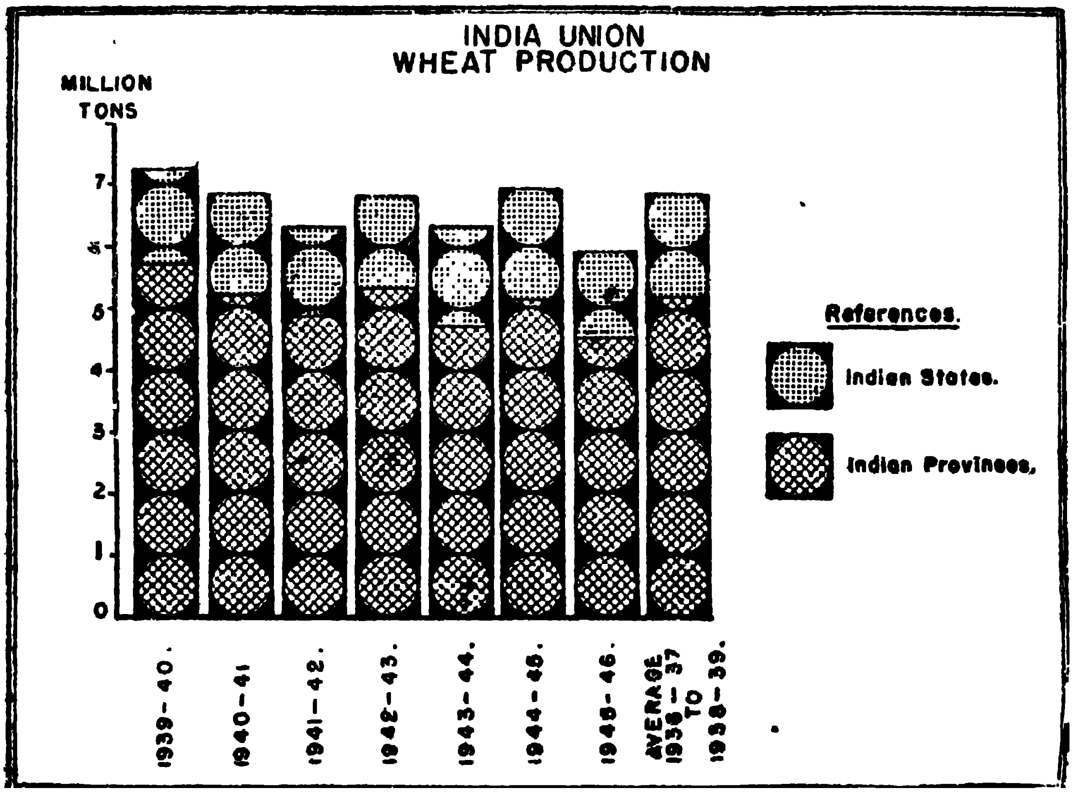

FIG. No. 103. Note the gradual fall in production from 1940 to 1942. The peak production was in 1939-40.

AVERAGE YIELD OF WHEAT

(lbs. per acre)

Uttar Pradesh	786	Hyderabad	231
Madhya Pradesh	444	Gwalior	458
Bihar	882		
Bombay	447	Madhya Bharat	382

The difference in yield per acre is due to the condition of water supply. The areas which are served by irrigation produce the higher yield while the area which depends only on rainfall has a lower yield.

In U. P. wheat is cultivated more or less throughout the province and the rich producing districts are Dehra-Dun, Shaharanpur, Muzaffarnagar, Meerut, Moradabad, Etawah, Shajahanpur, Budaun and Nainital, where more than 30 per cent. of the area is under wheat. The basin of the Narmada in Madhya Pradesh is also a rich wheat region. Although the monsoon discourages the wheat cultivation in West Bengal, about 98,000 acres are under wheat in Murshidabad and parts of Nadia.

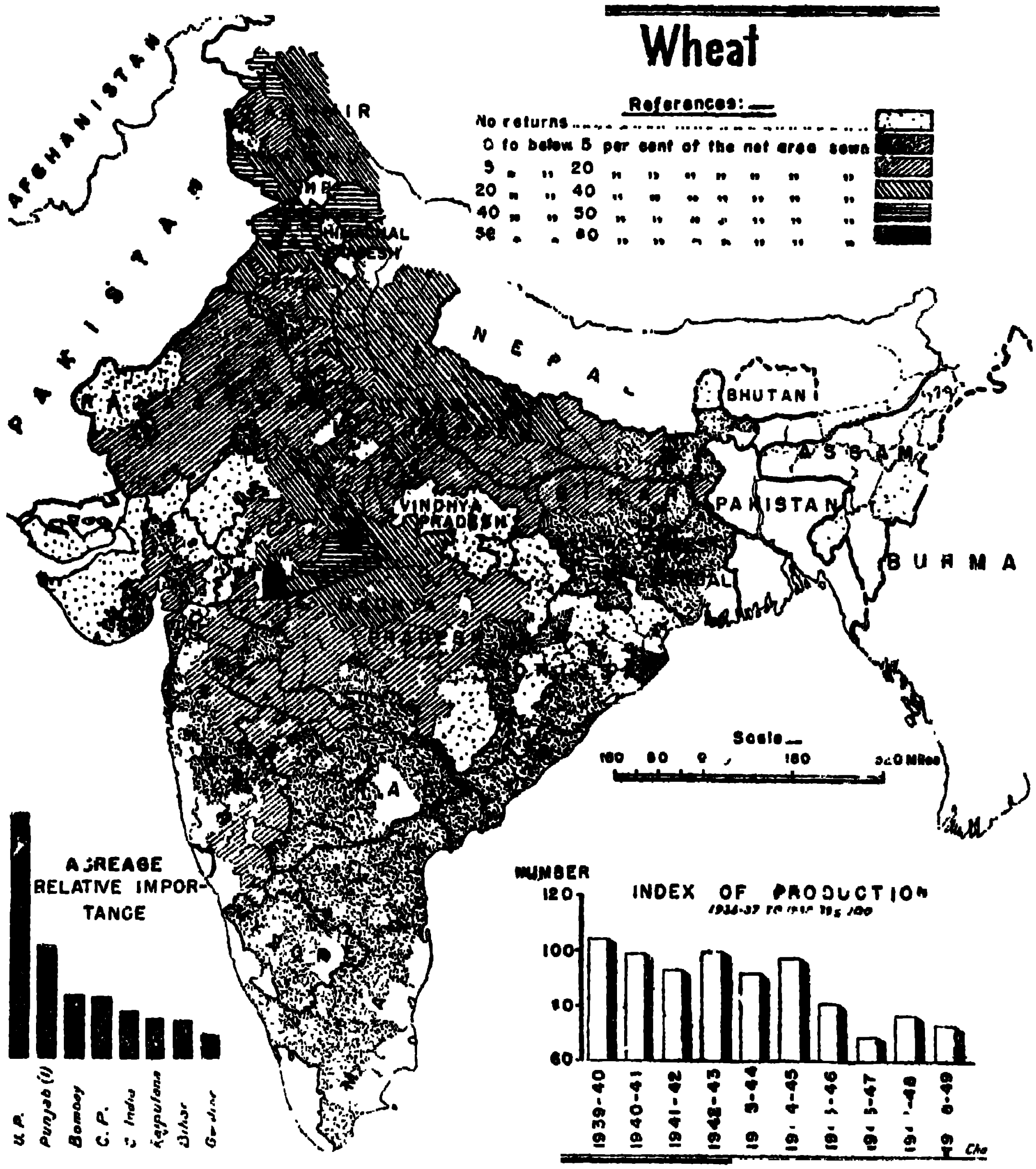

FIG. No. 104.

Nearly 45 per cent. of Indian wheat is consumed in the villages of production and the remaining 55 per cent. is put on the open market.

In India the average yield of wheat per acre is abnormally low. Other producing countries use farm machinery, grain elevators, better seeds etc., which help to increase enormously their outturn per acre. Indian cultivators are poor, conservative and illiterate and, therefore, cannot improve their methods of cultivation.

In 1951-52, the actual value of imports of wheat and wheat flour into India was Rs. 154 crores. According to the International Wheat Agreement, India secured an acceptance of her guaranteed purchase of 1 million tons per year for four years.

Till 1920 India used to export considerable quantities of wheat. The enormous increases of wheat production since 1920 in Canada, Argentina and Australia as well as the extension of cultivation in many European countries by protective measures, such as heavy import duties and the quota system, have resulted in considerable decline of demand on Indian wheat. Till 1914 the export of wheat from India was 14 per cent. of the total output, but in 1938-39 the percentage was only 2·8. Since 1942 there has been practically no export of wheat from India, firstly because of war up to 1945, and secondly because of partition of the country in 1947 which has made the West Punjab wheat unavailable to the Union.

The scope for further production of wheat is indeed great in East Punjab and U. P. but then in future exports may not increase, because the increasing population will require more wheat.

Millet is a short season crop and is grown generally in Madras, Bombay and the adjoining districts of Hyderabad. It flourishes best in hot lands which are fairly dry. It can be grown without irrigation even in areas where rainfall is scanty.

There are two varieties of millets in India—Jowar and Bajra.

Jowar is extensively cultivated in the Deccan, and also to some extent in other dry parts of India. The area under cultivation in 1950 was 36 million acres and the yield was 5 million tons. Bombay, Madras, M. P. and Hyderabad account for more than 50 per cent. of the total acreage under jowar in India.

Other areas are East Punjab, Gwalior, Central Rajasthan and Madhya Bharat. In the Sholapur district of Bombay more than 60 per cent. of the sown area is under jowar. In Poona and Belgaum districts the acreage under jowar accounts for more than 50 per cent. of the total area. Jowar is commonly called *Sorghum* in Europe and America. In India, the product is of great importance both as food and as fodder.

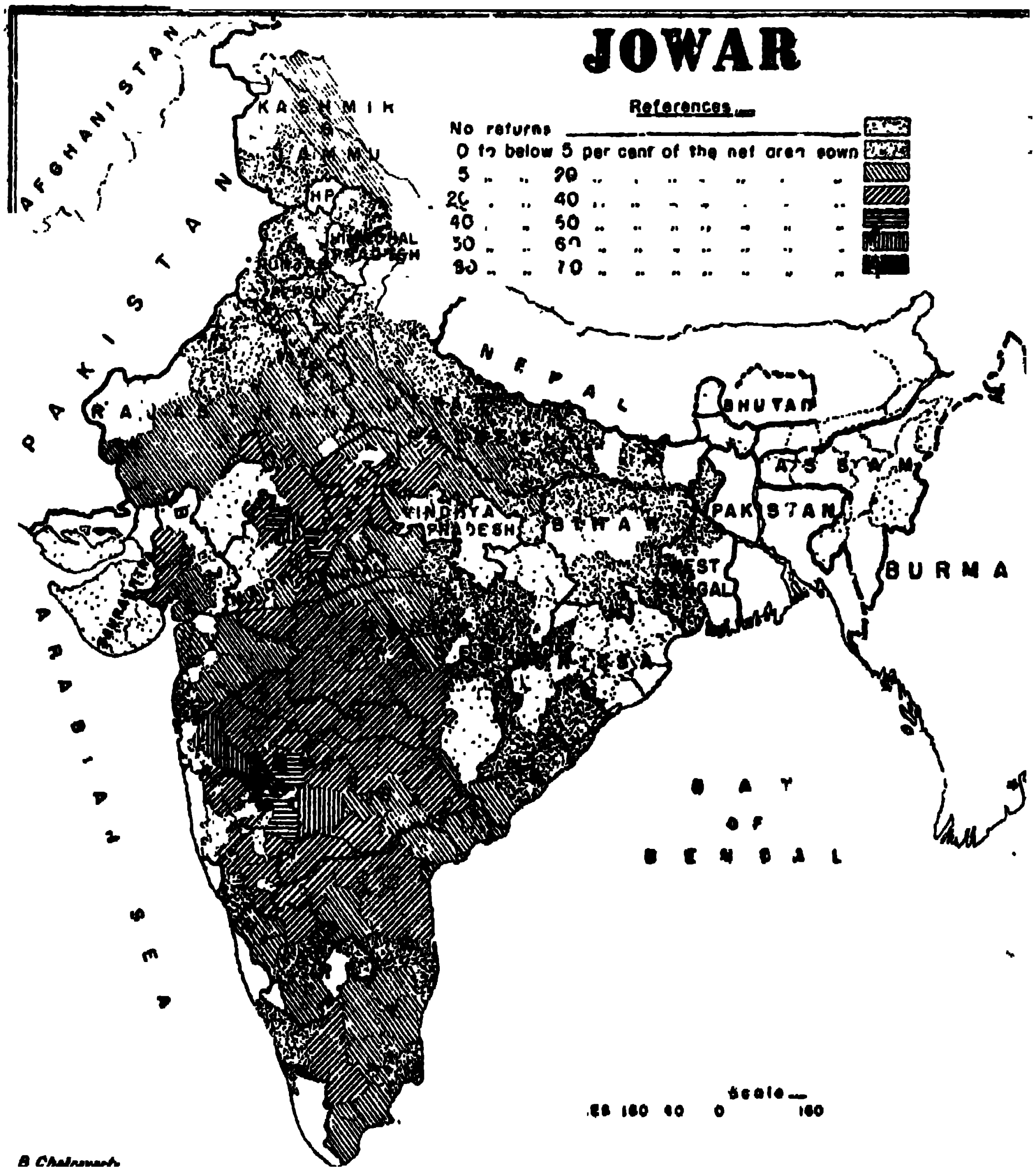

FIG. No. 105.

Bajra is a short season crop and is grown generally in poorer soils. It is less widely cultivated and is essentially a village food crop. Bombay, Madras, East Punjab, Hyderabad and Rajasthan are the principal producers. The area under cultivation was 20 million acres in 1949 and the yield in the same year amounted to 2 million tons. More than two-thirds of the acreage under bajra is confined to Bombay, Madras, U. P. and East Punjab. In Bhavnagar (in Kathiawar) bajra covers more than 60 per cent. of the sown area.

One-fourth of the total production of millets is exported and the destinations are Sudan, Arabia, Holland, Germany, Italian East Africa and Aden. More than 90 per cent. of the millet is shipped from Bombay.

Barley resembles wheat in general appearance and manner of growth. This can thrive on scanty moisture supply. If, in any year, rainfall is below normal for wheat cultivation, barley is substituted. Light and sandy soils are the best for barley. It can be cultivated even in alkaline soils. It is a winter crop in India and is sown in October and November. The harvesting season begins from the third week of March and is completed by the middle of April. Barley has a very short period of growth compared to wheat or grain. "Whenever owing to an unfavourable reason it is too late to sow gram or wheat, the farmer generally puts down barley as a catch crop."

India raises nearly 5 per cent. of the world's total barley. It is mainly grown in Northern India and the U. P. has the largest acreage. The Republic has an area of about 8 million acres under barley with average annual production of about 2 million tons. In U. P. the crop is relatively important having about 9 per cent. of the total cropped area under it. Its cultivation is very extensive in the Ganges basin of the U. P., particularly in the districts of Banaras, Jaunpur, Gazipur, Gorakhpur, Allahabad, Ballia, Pratapgarh, Azamgarh and in Garhwal. Its cultivation also covers a large percentage of the total sown area in Saran, Champaran and Muzaffarpur in Bihar. In Bihar, the area under barley works to about 5 per cent. of the total cropped area. Thus the two chief zones of barley production are (*a*) north-western districts of Bihar and the adjoining north-eastern districts of U. P. and (*b*) the south-eastern districts of East Punjab and the adjacent districts of U. P. The internal demand for barley is so high that exportable surplus cannot attain considerable dimensions. Consequently, India's share in the international trade of barley as an exporting country has been very small, amounting to a half per cent. of the total world exports in recent years.

Maize is found more or less all over India, but Northern India raises the major portion. Maize requires high temperature and much more summer rain than wheat. The soil should be rich and well drained. Most of the maize is grown in regions with an annual rainfall of at least 20 inches. The total area under maize is about 6·5 million acres with an average annual production of 2 million tons.*

State	(*In thousands*) Area (acres) 1950-51 Final estimate	Production (tons) 1950-51 Final estimate
Assam	... 45	10
Bihar	... 1,440	314
Bombay	... 434	52
Madhya Pradesh ...	... 284	59
Madras	... 44	19
Orissa	... 59	11
Punjab	... 738	161
Uttar Pradesh ...	... 2,047	641
West Bengal ...	... 94	24
Hyderabad ...	... 337	27
Jammu and Kashmir	.. 261	109
Madhya Bharat ...	... 505	40
PEPSU	... 167	49
Rajasthan ...	... 644	75
Saurashtra ...	... 1	...
Travancore-Cochin	... 1	...
Ajmer	... 77	12
Bhopal	... 16	2
Bilaspur ...	... 45	7
Delhi	... 2	...
Himachal Pradesh	... 240	60
Kutch	... ...	...
Vindhya Pradesh ...	... 82	...
Total	... 7,563	1,682

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* The estimated area for 1949-50 was 7·8 million acres and production 1·9 million tons. (*Agricultural Situation in India*, Vol. VI, No. 5, 1951, p. 371).

The U. P., Bihar and East Punjab are the leading producers. Maize cultivation is practised throughout U. P. and Bihar, although the Upper Ganges valley has a large acreage. North-Eastern Punjab and South-Western Kashmir are also rich producing areas.

The crop is raised mainly for consumption in the areas of production, and exports are never considerable. India exports an insignificant quantity of maize, a little more than 200 tons. Exports are mainly from Bombay and Calcutta. Bombay alone sends more than 50 per cent.

In recent years certain industrial firms of the Indian Republic have developed the production of starch and glucose from maize.

Pulses include food grains like gram, arhar, lentils or masur, etc. These grains are raised in different parts of India and consumed mostly in the areas of production. These grains are important both from the point of view of husbandry and of nutrition. Their nutrition value is great as a source of protein. More than fifty million acres of land accounts for the cultivation of pulses in India. Pulses constitute an important foodstuff not only for villages but for animals as well. They are also grown as rotation crops to restore the fertility of the soil.

Gram is the most important pulse and is grown extensively in the Uttar Pradesh. Other producing areas are Bihar, East Punjab and Madhya Pradesh, Bombay, Hyderabad and Mysore. The average annual output is nearly 5 million tons and the acreage exceeds 20 million. In 1951 the acreage was 19·3 million acres. Gram is often cultivated in combination with wheat.

The percentage of acreage is greater in Southern Uttar Pradesh (between Agra and Mirzapur), North-East Punjab, Central Bihar, South Mysore and in North-East M. P. Local consumption being great, exports of gram are never considerable.

Lentil or Masur is grown particularly in the Central Provinces, Madras and the Uttar Pradesh, though in other provinces its cultivation is not uncommon. "*Arhar* is one of the most important food-stuffs of the country-side and is generally grown as a mixed crop, particularly in rotation with cereals." The annual production of these two pulses is very considerable. The exports of pulses are made to the U. K., Ceylon, Mauritius, Burma and France. Calcutta, Madras and Bombay participate in the trade.

Tea. India is the largest tea-producing country in the world. The region of Indian tea-cultivation is a wide one. Beginning with the Himalayan plantations in the Punjab near 33°N. latitude, it extends to the Peninsular India between 10° and 13°N. latitude. The principal belt of tea-plantations lies between 23° and 32°N. latitude.

Tea-plant requires a deep fertile soil, which must be exceptionally well-drained, so that there may not be stagnant water on it. It is, therefore, generally grown on hill-sides. High temperature is essential for tea-cultivation.

Seventy five per cent. of Indian tea is obtained from Assam and West Bengal. In recent years, Southern India has become an important tea-producer and she contributes nearly 20 per cent. of the Indian output.

AREA UNDER TEA IN THE DIFFERENT STATES OF INDIAN UNION 1949

States	Area (in 000 acres)	States	Area (in 000 acres)
Assam ..	.. 366	Mysore ..	.. 5
West Bengal ..	.. 169	Travancore ..	.. 77
Bihar ..	.. 4	Tripura State	. 11
Madras ..	.. 78	Cochin ..	.. 2
East Punjab ..	.. 10		
U. P. ..	.. 6	Total ..	725

The yield in the same year was 586 million lbs. in the Union. Tea production in 1950-51 was about 600 million lbs.

Assam is the largest producer and contributes more than 50 per cent. of the total Indian tea production. In the districts of Darrang, Sibsagar, Lakhimpur (in the Upper Brahmaputra valley) and in Cachar tea-plantations cover more than 30 per cent. of the sown area. The Sadia Frontier Tract also grows a large amount. These areas are served magnificently by railways and rivers.

Although West Bengal occupies the second position in the list of tea-producing provinces, her tea-cultivation is not so extensive as that of Assam. The two adjoining districts of Darjeeling and Jaipaiguri produce almost the entire output of

West Bengal. West Bengal production varies between 20 to 25 per cent. of the Union's total. The Tripura State raises a small quantity. Tea is also grown in Purnea, Ranchi and Hazaribag in Bihar ; Garhwal and Almora in the U. P. ; and Kangra in East Punjab.* In Southern India, the major portion of the output is raised by Travancore and Madras ; the other areas are Coorg, Mysore and Satara (Bombay).

India is the greatest tea-exporting country in the world, supplying as she does about 50 per cent. of the world's trade in tea.

SHARE OF INDIA IN WORLD'S EXPORT OF TEA

(000 tons)

	1937	1949		1937	1949
India ..	151·4	161·9	Japan & Formosa	24·5	4·0
Ceylon ..	97·6	136·2	Indo-China ..	2·0	1·4
Indonesia ..	66·7	9·3			
China ..	51·1	17·5	Total ..	395·3	330·6

India exports usually 76 per cent. of the total tea produced in the country. The recipients of Indian tea are the U. K., France, Canada, the U. S. A., Australia and New Zealand.

EXPORT OF TEA

(In 000 lbs.)

U. K.	286,974	287,824
U. S. A.	37,598	26,604
Irish Republic	28,043	24,104
Canada	20,978	19,157
Australia	16,941	6,448
Iran	11,430	10,938
U. S. S. R.	——	5,123
Kuwait	5,011	8,095
Total ...	439,225	425,518

In these foreign markets, Indian tea has to compete with the tea of Ceylon, China and Java. During World War II,

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* Bihar, Uttar Pradesh and East Punjab account for 5 per cent. of the total area under Tea.

India and Ceylon were the only suppliers of tea to the world market because Java, Japan, China and Sumatra were in the war zone and their tea production was very much disturbed. Until

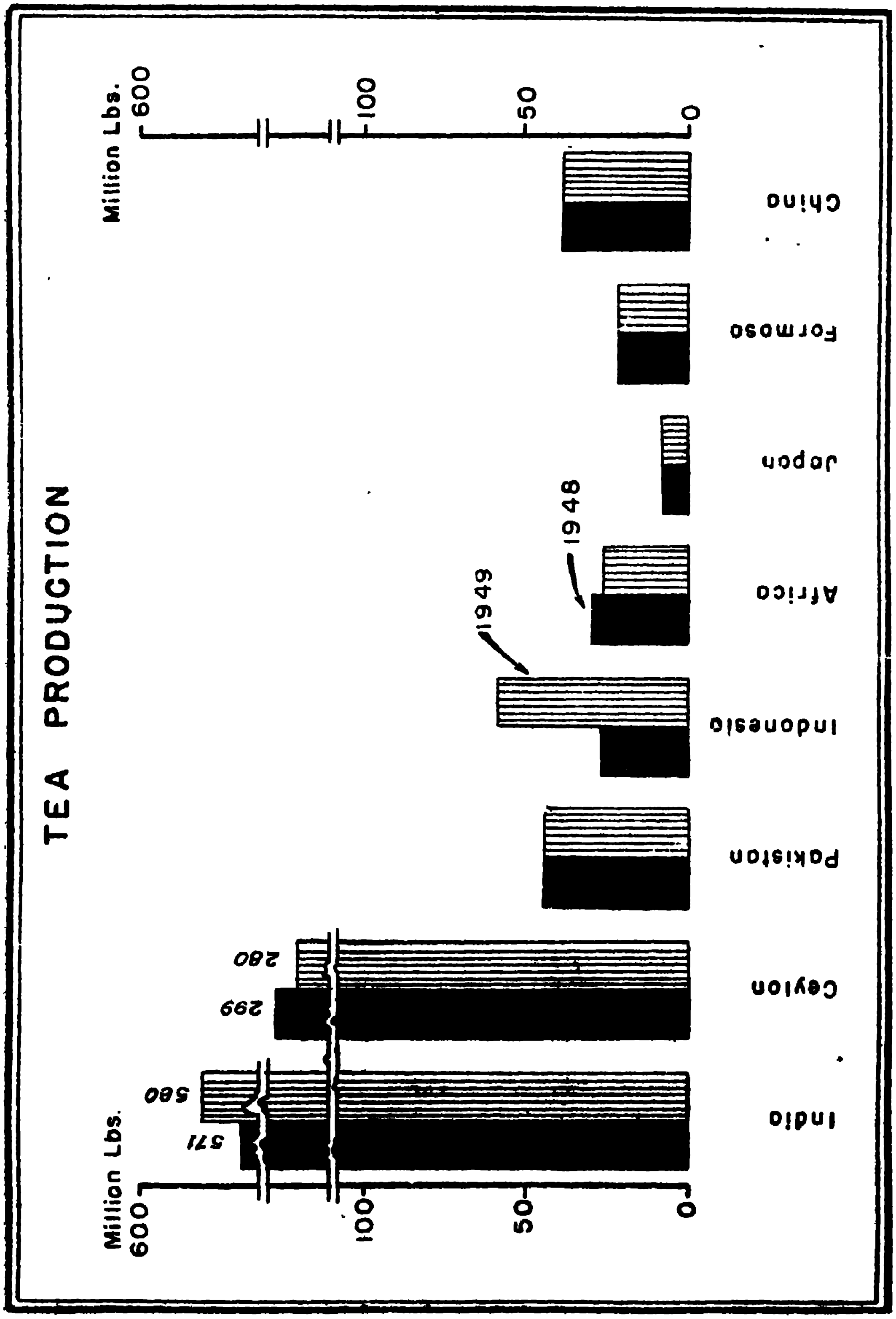

Fig. No. 106.

the production position of these countries improves, Indian tea will have great demand in the world market. There are fair prospects of a better market for Indian tea in New Zealand. If shipping facilities at Calcutta and Cochin are improved, it may be possible to sell annually about 5 million lbs. of Indian tea in New Zealand against 1 million lbs. as at present.

The share of Calcutta in the total export of tea is usually 83 per cent. and the remainder is shipped from Madras.

SHARE OF PORTS IN TEA TRADE

(*in 000 lbs.*)

	Calcutta	Madras	Cochin	Bombay
1949-50 ...	378,593	59,779	—	—
1950-51 ...	374,722	61,135	—	—
1951-52 ...	354,273	3,932	61,706	5,626

The export of Indian tea is regulated according to the terms of the *International Tea Agreement.* Between 1927 and 1932, there was a great over-production of tea in the different producing countries, as a result of which prices fell below the cost of production. On 1st April, 1933, an agreement was reached by India, Ceylon and Java which contained the following points: "(*a*) That the exports of tea from the producing countries be regulated in order to restore equilibrium between supply and demand ; (*b*) That the governments of the respective countries will undertake to prohibit exports in excess of the quotas agreed upon ; (*c*) That the agreement shall be for a period of five years ; (*d*) That the existing tea area must not be extended during the said period of five years except in special cases where the existence of an estate would otherwise be imperilled."

According to the Agreement, India's standard quota was 380 million lbs. In 1938 the agreement was renewed for another five years. During the war years of 1939-45, India's export quota was increased to meet the world shortage of tea. A Board has since been formed in India to look after the interests of the Indian tea industry. Its name is *Central Tea Board.* By means of propaganda, the Board is popularising Indian tea in villages and towns. Apart from newspaper and magazines publicity and posters, propaganda is also carried on in the way of service, that is, by educating the potential tea-drinker in making a proper drink of tea.

The new International Tea Agreement was signed by India on 1st April, 1948 for the regulation of export and production. The agreement has been extended till 1955.

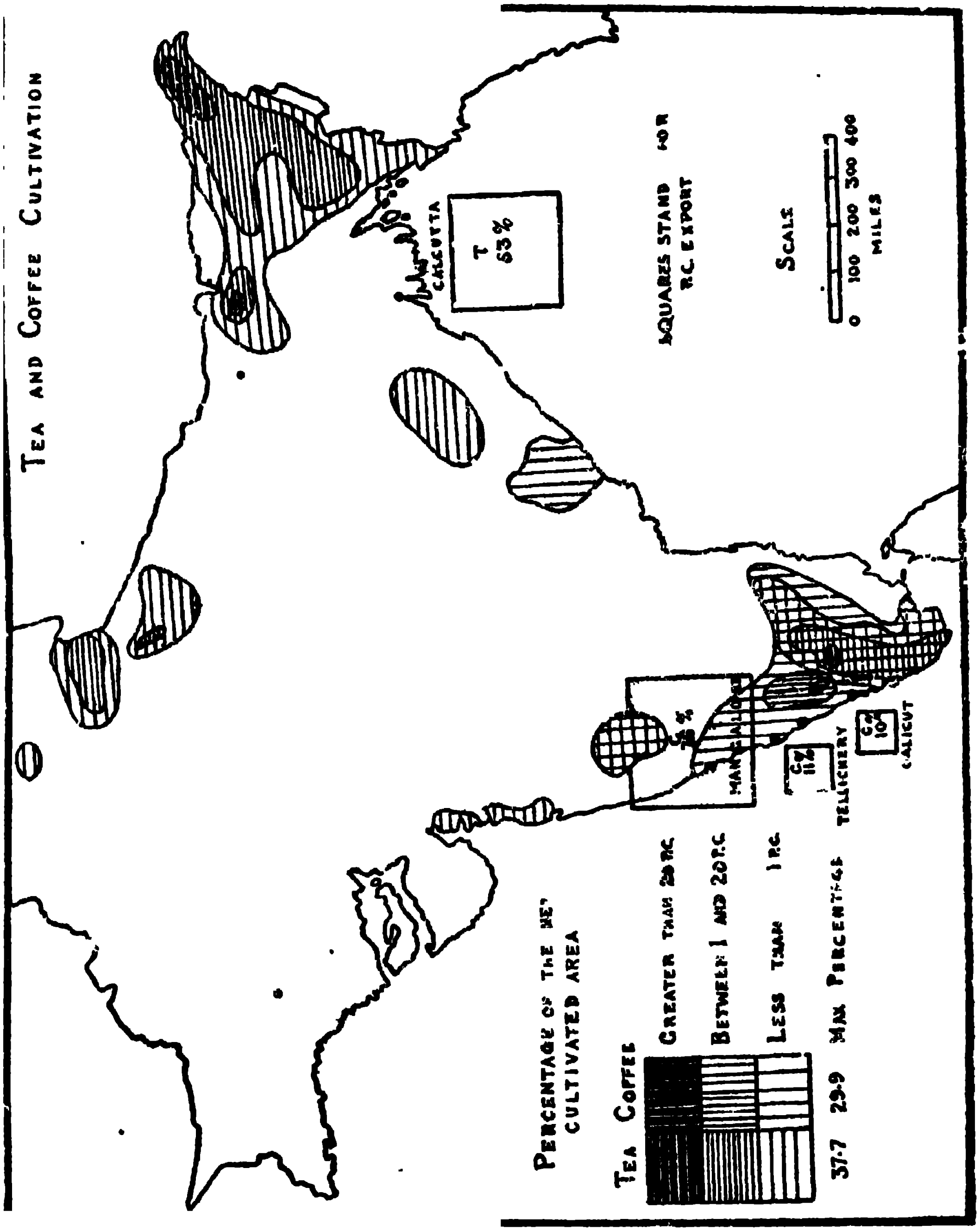

FIG. No. 107. Note the extensive tea belt from North East Assam to North East Bihar. More than 50 p.c. of Indian coffee is obtained from Mysore.

In 1948-49 India was permitted under the International Tea Agreement to have 775,700 acres under tea. Permissible acreage in India under the Agreement is 806,728 till 1955. The export allotment for 1949-50 which aggregated 435 million lbs., has been raised to 452 million lbs. in 1950-51.

Coffee. The systematic cultivation of coffee in India was started from 1830 when a large plantation was opened in Mysore. Southern India has the monopoly of coffee cultivation in India.

The coffee plant requires a rich well-drained soil, a warm climate and a moderate supply of moisture. An annual rainfall of between 60 and 100 inches is usually considered the most suitable. The optimum temperature is between 59° and 77°F. Shade is required to protect the plants from too direct light and heat. Shade improves the growth conditions and prolong the vitality of the plant. Three to five years are required for the plant to mature after which it bears fruits for some thirty years. The plantations are generally located between levels 2,000 and 4,000 feet on hilly forest land. These areas are exposed to the summer monsoon. The optimum altitude and rainfall vary between districts : in North Mysore the best yields are obtained from estates at an altitude of about 4,000 feet with an annual rainfall of 50 inches, in North Coorg, at 3,500 feet with a rainfall of 80 inches.

In India the plant is sown in the rainy season and the berries begin to ripen in October. Plucking and hand-picking of berries continue till January.

Nearly 2,00,000 acres of land are under coffee plantations and the average yield exceeds 3·5 million lbs. In 1950 coffee production in India was 20,360 tons. The annual consumption of coffee in the country is about 17,000 tons.

*COFFEE : ACREAGE, PRODUCTION AND AVERAGE YIELDS

Areas		Acreage 1935-39	(1000 lbs.) Production 1935-39	Average yield per acre in lbs.
Madras	...	43,711	9,136	205·2
Orissa	...	59	—	—
Coorg	...	39,949	9,586	249·9
Mysore	...	101,003	16,127	160·6
Travancore	...	998	141	142·7
Cochin	...	1,962	386	196·3
Total	...	186,682	35,376	187·3

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* *The World's Coffee*, 1947, F.A.O. Rome, page 250.

Since 1939, the production and acreage under coffee have not increased much. In 1949, the acreage was 215,000 and production 34,971 lbs.

Seventy p.c. of Coffee acreage is Indian-owned and 30 p.c. European-owned.

Southern India has nearly 7,000 coffee plantations which engaged 65,000 permanent labourers and 35,000 temporary labourers. Mysore alone possesses 4,600 plantations. In Mysore, the plantations are mostly confined to the south and west, particularly in the districts of Kadur, Shimoga, Hasan and Mysore. Mysore has the largest acreage under coffee plantation and the production is always over 50 per cent. of India's total. In Madras coffee plantations are found mostly in the south-west—from North Arcot to Tinnevelley including the western areas. The Nilgiri is the most productive area of Madras. Some plantations are also found in Vizagapatam in the north-east. Madras contributes nearly 23 per cent. of the Indian output. In Coorg more than 20 per cent. of the total acreage is under coffee and the region supplies more than 1 per cent. A little coffee is also grown in the Satara district of Bombay.

Fifty per cent. of the annual production of coffee is consumed in India. The Indian coffee industry is therefore very much dependent upon foreign markets.

Indian coffee is exported to the U. K., France, Germany, Holland, Belgium, Australia and Iraq. Participating ports in the export trade are Mangalore, Tellicherry, Calicut and Madras (Mangalore 76 p.c., Tellicherry 11 p.c., Calicut 10 p.c., Madras 3 p.c.). The exports of Indian coffee have fallen off considerably as a result of the competition of Brazilian coffee which to-day dominates the coffee market of the world.

EXPORT OF COFFEE

(*In cwt.*)

	1949-50	1950-51	1951-52
U. K.	16,288	11,831	5,647
Holland	3,757	6,251	812
France	29	9,898	2,167
Australia	7,137	2,217	2,022
Iraq	900	3,054	500
All total	66,628	53,533	16,063

The Indian Coffee Board is now engaged in finding out markets for Indian Coffee, both in India and abroad. The Indian Coffee Board which is constituted under the provisions of the Coffee Market Expansion Act, 1942 controls the marketing and export of coffee. All coffee grown in the country is required to be delivered into a pool maintained by the Coffee Board. Coffee is released for the internal market through public auctions and co-operative societies and exports are allowed only under Licences issued by the Board. Propaganda in the U. K. and other parts of Europe is met by the levy of a customs duty at the rate of a rupee per cwt. on coffee exports and an excise duty at the same rate levied on coffee released for consumption in India. Propaganda measures for increasing consumption were initiated in 1936. In India coffee houses have been opened in several towns like Calcutta, Bombay, New Delhi and Secunderabad.

The **Tobacco** plant was first introduced into India by the Portuguese in 1508. It has a wide climatic range and is cultivated in India throughout the country. The harvesting period is between February and April.

India is the second largest tobacco-producing country in the world and contributes about 35 per cent. of the world's total. India, together with the U.S.A., and China, accounts for 60 per cent. of the world's tobacco-growing areas, which is of the order of 7·2 million acres. Nearly 1 million acres of land are under tobacco cultivation and the average production is about 250,000 tons a year. In 1951 the area under tobacco in India was 850,000 acres and production 246,000 tons.

Tobacco cultivation is geographically confined to two main zones—the Eastern Zone, comprising Bihar, U. P. and West Bengal and the Southern Zone which comprises Madras, Mysore and Bombay.

The districts of Muzaffarpur, Darbhanga, Monghyr and Purnea produce 90 per cent. of Bihar tobacco. In 1947-48, the Eastern Zone had under tobacco about 200,000 acres and the production was about 68,000 tons. Bihar had 120,000 acres with 42,000 tons in the same year. In West Bengal, tobacco tracts include Jalpaiguri and Cooch Bihar ; some quantities are also raised in Hooghly. West Bengal raises only cigar tobacco and hookka tobacco.

In Madras, the important tobacco-growing districts are Guntur, Vizagapatam, East Godavari, Coimbatore and Madura. Two-thirds of the total acreage of Madras are confined to Guntur. Madras is noted for cigarette virginia, cigar tobacco, cheroot tobacco, chewing tobacco and snuff.

In Bombay, the tobacco-growing regions are Belgaum, Satara, Baroda and Kaira.

Outside these two zones, tobacco is cultivated in the East Punjab, particularly in the districts of Jullandhar, Hosiarpur and Gurdaspur, and also in the Bidar district of Hyderabad.

The leaf produced in India is generally of coarse, heavy type, with a dark colour and a strong flavour and, as such, it is unsuitable for cigarette-making. Indian leaf makes an excellent filler. The loose cotton soil combined with the moist climate of Guntur, Kistna, East and West Godavari districts produce the best type of virginia. These districts alone yield 95 per cent. of India's cigarette tobacco. Guntur is the chief market. The production of tobacco similar in colour, flavour and texture to the recognised virginia tobacco is being raised in Madras and Bihar.

The bulk of the tobacco grown in India is consumed in the local areas, and the exportable surplus is never considerable. India exports unmanufactured tobacco to U. K., U. S. S. R., Netherlands, Aden, Hongkong, Sweden, Ceylon and Kenya. In 1951-52, the quantity of unmanufactured tobacco exported was 99 million lbs. of which U. K. alone took 42 million lbs.

EXPORTS OF RAW TOBACCO

(In 000 lbs.)

	1950-51	1951-52		1950-51	1951-52
U. K. ..	38,790	42,146	Aden ..	4,248	4,618
Hongkong ..	1,260	18,217	Pakistan ..	7,554	2,261
U. S. S. R. ..	4,408	7,582			
Holland ..	6,186	2,328	All total ..	93,031	99235

About $\frac{5}{6}$ths of the exports are handled by Madras, the share of Bombay being 10 million lbs. and of Calcutta, hardly 1 million lbs. The U. K. has always been the chief market for Indian tobacco.

The Government of India have set up a Tobacco Committee which pays attention to the improvement of flavour and aroma of the Indian tobacco and also to the problem of production, processing and marketing. If proper attempts are made, Indian Union can curtail the imports of finer grades of cigarettes as well as create markets in the Middle East, Europe and Pakistan for tobacco.

There is a great future for tobacco industry in India. India's annual consumption of cigarettes is estimated at several millions. About 90 per cent. of the huge consumption of cigarettes is produced by foreign interests, while 3 per cent. represents direct import and only the remaining 7 per cent. is indigenous production.

Sugar-cane. India is not only the original home of the sugar-cane but she is also the largest producer in the world.

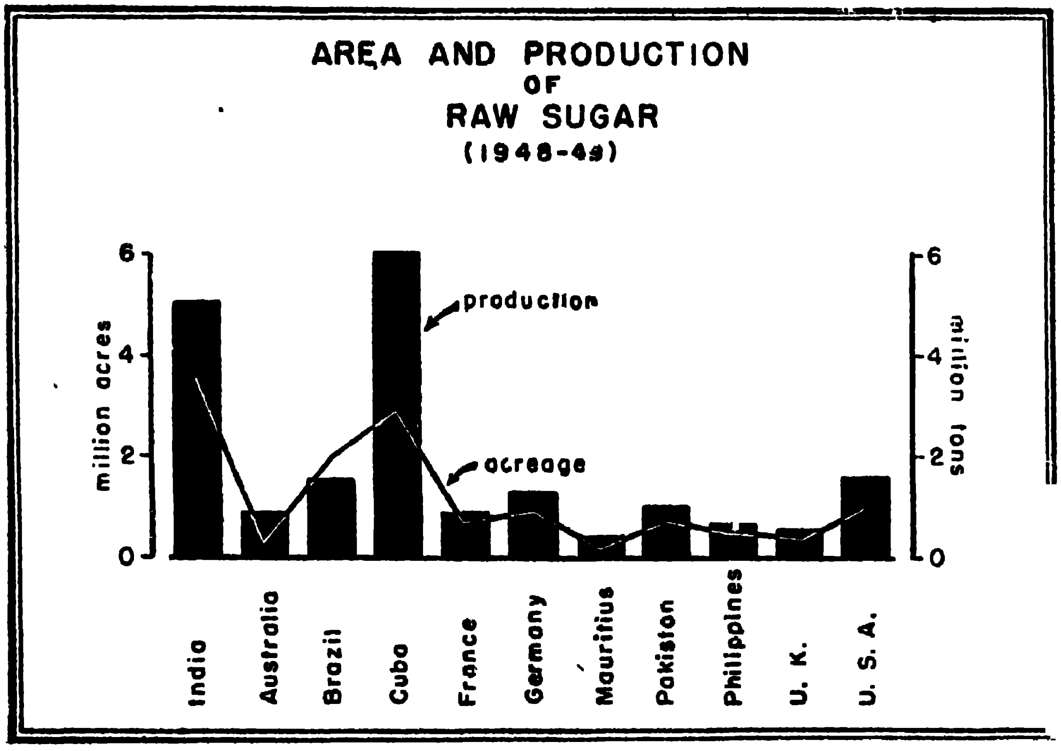

FIG. No. 108. Note the greater production with lesser acreage in 1948-49 than that in 1939-40.

India has approximately 37 per cent. of the world's sugar-cane area. Although sugar-cane is cultivated throughout India, the most important sugar-cane tracts are in the U. P., Bihar, West Bengal, East Punjab and Bombay. In fact, Northern India has a preponderant interest in the crop. From the point of view of climate and soil, the Peninsular India is ideal for sugar-cane cultivation. The average yield of sugar-cane in the South is about four times as high as that in the north. Efforts should, therefore, be made to grow more sugar-cane in the south. There is an additional advantage in the fact that the crushing period of sugar-cane in the south is almost twice as long as that of upcountry plantation. Thus geographically, the Uttar Pradesh and Bihar are not as suitable as Bombay, Madras and Mysore are in the matter of sugar-cane cultivation.

AREA AND YIELD OF SUGAR-CANE IN 1949-50

Regions	Area (000 acres)	Yield of raw sugar (000 tons)
Uttar Pradesh	2,130	2,661
Bihar	379	275
East Punjab	279	317
West Bengal	57	89
Madras	191	536
Bombay	151	420
Orissa	59	108
Assam	59	68
Hyderabad	57	106
Others	279	324
Total	3,641	4,904

The sugar-cane acreage in 1951 was 4·1 million acres and the production of raw sugar was 5·4 million ton. In the same year, the total production of sugar was 1,450,000 tons which left a surplus of about 400,000 tons of sugar after meeting the internal demand. Thus the sugar position in India has very much improved.

The Uttar Pradesh produces more than 50 per cent. of India's total output. The plant is cultivated throughout the province and the higher acreage is devoted to it in Shaharanpur, Shajahanpur, Fyzabad, Gorakhpur, Azamgarh, Ballia, Jaunpur, Banaras and Bulandshahr. In Bihar, the important districts are Champaran, Saran, Darbhanga and Muzaffarpur.

East Punjab which is the third largest sugar-cane producing province in India with a produce less than one-tenth that of the U.P. cultivates the plant extensively in Amritsar, Jullandhar and Rohtak.

West Bengal also produces a large quantity of sugar-cane, but the quality is poor. The producing districts are Birbhum, Burdwan and Nadia. About 67,000 acres of land are under sugar-cane in West Bengal.

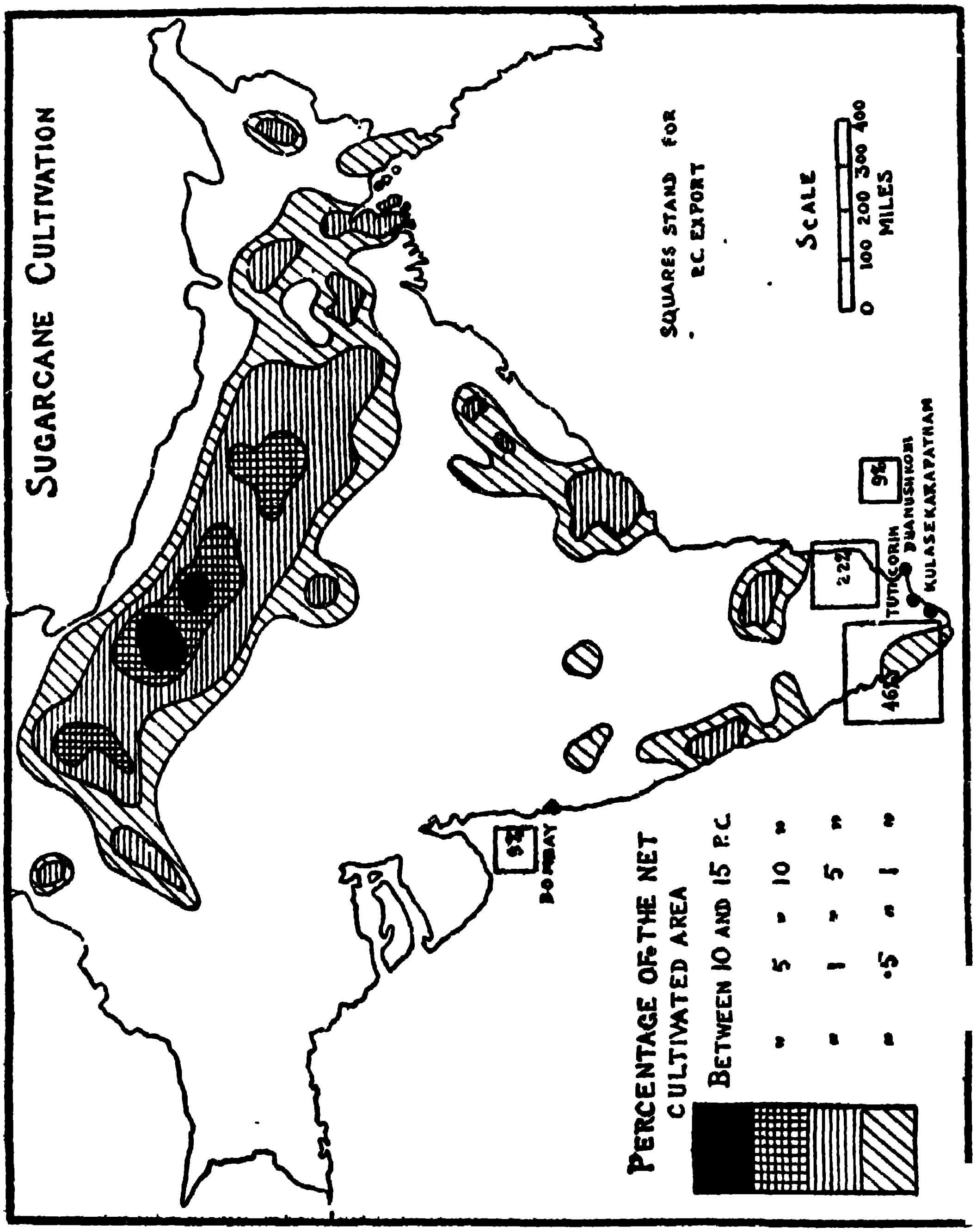

FIG. No. 109. Note the great concentration of sugar-cane cultivation in the Ganges valley. The U.P. alone raises more than 50 p.c. of India's raw sugar.

India's sugar production per acre is the lowest in the world, being 1·50 to three tons ranging from cane to cane. It has been established that "in actual sugar, India's production per acre is less than one-third that of Cuba, one-sixth that of Java, and one-seventh that of Hawaii". The reason for the low average yield is that Bihar and the Uttar Pradesh at present grow bulk of the cane, and these two areas are not geographically ideal for sugar-cane cultivation because of their location in the Sub-tropics. Moreover, small and scattered nature of the holdings and backward methods of cultivation retard progress towards increased yields. Consequently, the price of sugar-cane has remained high. Sugar-cane cannot be cheaper unless the country produces more of it by increasing the *yield per acre* and not by increasing the area of cultivation. At the same time it must be remembered that mere increase in the average yield per acre will not help the sugar industry much unless at the same time the sucrose content in the cane is made higher.

Although sugar-cane is a quality product, its price in India is determined by the weight and not by quality and sugar content. The cultivators therefore feel encouraged to produce higher cane yields which actually result in lower sugar yields. The attitude should be to produce cane of improved quality for increased output of sugar.

Recently, improved varieties of sugar-cane are being raised in different provinces. It is also possible to introduce in India the methods of cultivation adopted in Java with suitable modifications to suit local conditions. Already a good amount of research work is being carried out in the various sugar-cane centres of India. The improvement of sugar-cane cultivation and the study of its pests and diseases are being carried on under the Indian Central Sugar-cane Committee.

Jute is the most important bast fibre of India and is an object of world commerce. Since partition India has become a net importer of raw jute. "The demand for jute in the world's markets is based upon the fact that no cheaper fibre is procurable for bagging agricultural produce." The cultivation of the plant is restricted mainly to the Ganges-Brahmaputra delta in Bengal and Assam and in Bihar and Orissa, where the soil is enriched by alluvial deposits brought by river inundation favouring the growth of this exhausting crop without any expenditure on manure. Jute is sown from March to May and it grows to a height of ten to twelve feet. The harvesting period begins in July and extends to September. In West Bengal, sowing is done in April and May, and harvesting time is mid-August to September. In Bihar and Assam, time of sowing is March to April while in Orissa, it is May-June.

Jute requires for its successful cultivation a hot damp climate in which there is not much rain in the early part of the season. It grows best on a loamy soil or rich clay and sand, although the bulk of the total quantity of jute grown in Bengal is cultivated on *chars* and sand banks and islands formed by rivers.

The fibre from the stem is separated after the plant is retted in a pool of stagnant water for 20 to 25 days according to the nature of the water. Though the usual practice is to do the retting in tanks and roadside stagnant pools, in some districts the plant is submerged in rivers also.

JUTE-GROWING AREAS IN INDIAN UNION

	Acres 1936-39	Yield Average 1936-39	Acres 1949-50 (in 000)	Yield (1949-50) (in 000 bales of 400 lbs.)
West Bengal ...	208	624	493	1452
Bihar	408	805	335	770
Orissa	18	40	54	151
Assam	200	474	259	717
Cooch Behar ...	32	69	...	...
Tripura	8	17	13	26
Total ...	874	2029	1159	3116

In 1950-51, Indian Union produced 3,300,000 bales of raw jute in 1·4 million acres of land. The acreage and production in the main jute-growing areas in 1951-52 were as follows:

	Acreage (in 000)	Production (in 000 bales)
West Bengal ...	876	2,331
Bihar	487	956
Assam	334	840

The average yield of jute per acre is the highest in Bihar with 1149 lbs., followed by Assam 1056 lbs., Cooch Bihar 1070 lbs., West Bengal 961 lbs., Tripura 945 lbs. and Orissa 800 lbs.

In Bihar over 90 per cent. of jute cultivation is concentrated in the district of Purnea ; in Orissa more than 92 per cent. of jute is raised in the Cuttack district ; and in Assam jute is raised throughout the Brahmaputra valley.

Jute is produced mainly for foreign markets. The destinations of jute are U.K., Germany, Japan and U.S.A. Raw jute constitutes a small portion of the total jute exports. The principal buyers of Indian jute are U.K., U.S.A., France, Italy, Brazil, Japan, Belgium, Germany and Spain. The U.K. alone takes nearly one-third of the total exports.

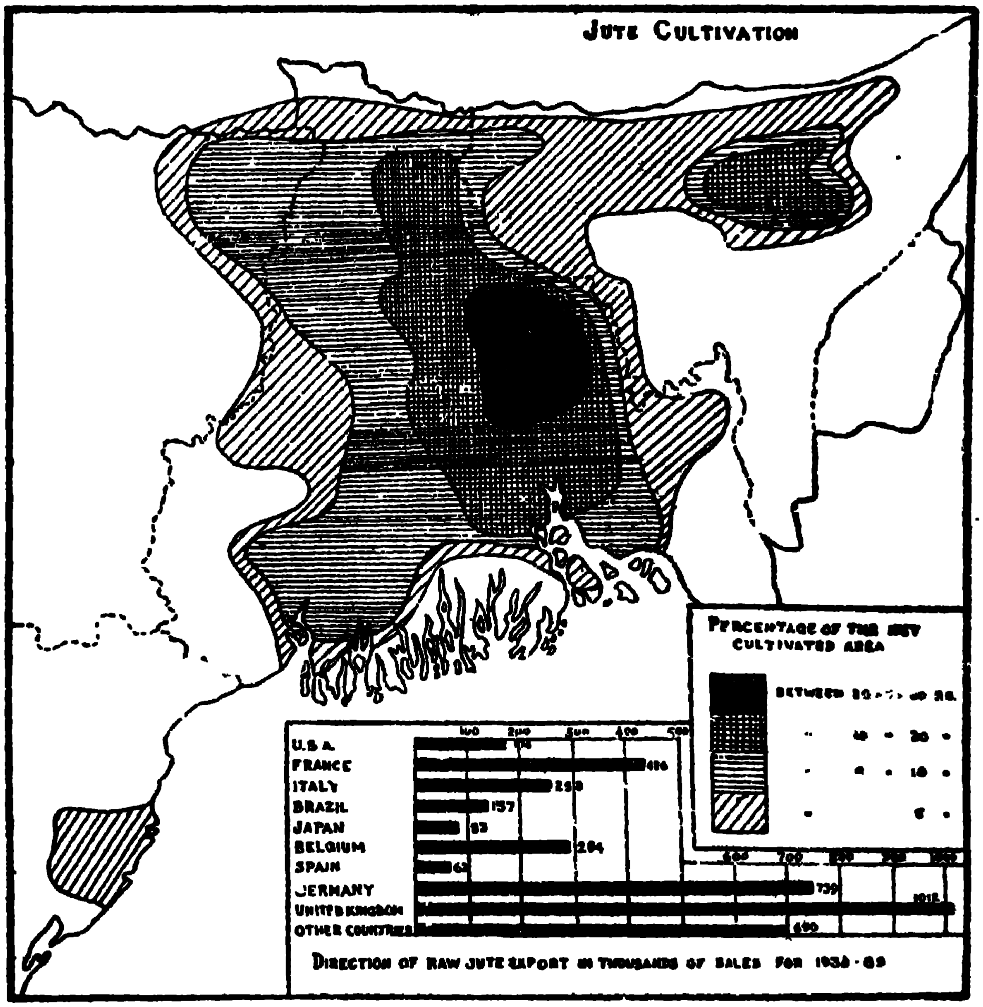

FIG. No. 110. In undivided Bengal less than 10 per cent. of the cropped area raised over 85 per cent. of the total Indian jute and, as such, the product exerted a tremendous influence on the economic life of the province. The main jute belt, which accounts for nearly four-fifths of the total acreage under jute in Bengal, is in Eastern Pakistan.

Immediately after partition in 1947, Indian Union had only 6·4 lakh acres of land under jute cultivation which gave a yield of 17 lakh bales of raw jute. In *1951-52 the yield was 47·7 lakhs of bales as against India's total requirements of 68 lakh bales.* The gap between the production and requirement is met partly by the use of jute substitutes such as *mesta* and partly by imports from Pakistan. According to Jute Agricultural Research Department, very soon 330,000 additional acres of land will be put under jute cultivation in the following areas :

West Bengal ..	.. 100,000	Travancore ..	.. 50,000
Bihar ..	.. 50,000	Madras ..	.. 20,000
Orissa ..	.. 50,000	Cooch Behar ..	.. 5,000
Assam ..	.. 50,000	Tripura ..	.. 5,000

Active steps are also being taken to grow jute in the Uttar Pradesh so that her three mills may be self-supporting. Already 15,000 acres are under jute cultivation in U. P. in the Sub-montane tracts along the foot of the Himalayas which are fed by the rivers Sarju, Gogra, Sarda and Chawka and remain water-logged for at least nine months of the year.

The Agricultural Research Institute has introduced *a new system of cultivation, as a result of which, not only has the cost of cultivation been lowered, but the yield and quality improved considerably.*

Jute is usually sown broadcast, and when the seedlings grow they are thinned out to ensure a rich crop. This system of cultivation involves wastage of seed and requires hand labour at the time of weeding.

Under the new plan, jute is sown in lines, and not broadcast and the seeds are grown three to four inches apart in furrows drawn at intervals of one foot. In line-sown jute all subsequent operations, such as periodical weeding between the beds, are done by means of wheel hoes.

As a result of the production drive the jute yield in the Union in 1949-50 is expected to be 32 lakhs of bales.* To encourage further extension of jute cultivation, it is desirable that there should be fixation of minimum prices for jute in areas where jute growing may be unremunerative.

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* An all-out effort is now being made by the Central Ministry of Agriculture to make India self-sufficient in jute by 1952.

The increased production during the past two years coupled with the new measures being adopted by the Government of India's Research Institute in Chinsurah, justified the expectation of the country's self-sufficiency in jute within the next two years.

From April, 1948 India and Pakistan raised export duties by 33⅓ per cent. on raw jute and jute manufactures. The raising of duty on raw jute coming from Pakistan to Indian mills, coupled with the fact that Pakistan has not devalued her currency in line with India, will add heavily to the ultimate cost of jute manufactures in India. The increased cost of jute manufactures will adversely affect the exports from India and encourage the use of substitutes in consuming countries.

Hemp. There are three varieties of hemp in India—Sisal hemp, Sann hemp and Indian hemp. As a fibre, sann hemp is the best and is grown in Bombay, Madhya Pradesh, the Uttar Pradesh and the districts of Godavari, Kistna and Tinnevelly in Madras. Large quantities of raw sann are exported to the U.K., Belgium, Italy, France and Germany. Indian hemp is more important for narcotics in the form of *bhang, ganja* or *charas* than for fibre. As a source of fibre it is now grown in the North Himalaya region comprising Nepal, Simla, Kashmir, Kumaon and Kangra.

Sisal hemp has been least exploited commercially. It is grown in Tirhoot, Bombay and Southern India.

Cotton. India is the second largest cotton-producing country in the world, preceded by the United States of America only. In spite of the fact that she occupies the second position, her share in the world-production is less than one-fifth. Besides, the quality of Indian cotton is inferior. Indian cotton is of a short staple and is good for coarse fabrics only. Cotton holds the first place among the commercial crops of India.

Cotton has a considerable climatic range. It grows in the dry region of Bombay as well as in the moist province of Bengal. Generally speaking it is a dry-region crop and flourishes where the rainfall is less than 40 inches. The soil is equally important. The sticky black soil of the Deccan is ideal for cotton cultivation. Cotton is cultivated in Bombay, M.P., Berar, Madras, U.P., Hyderabad, Madhya Bharat, Baroda, Rajputana and Mysore. Half the total area is confined to Bombay and Berar. There are two varieties of cotton in India: (*i*) The Indian or short-staple cotton and (*ii*) the American cotton.* The bulk of the production comes in the shape of Indian cotton. In recent years, some progress has been made in the Indian Union in the production of long-staple cotton.

In India, cotton is considered long-stapled when the fibre is one inch long. When the fibre is below 7/8 inch and about 11/16 inch, it is medium staple. The fibre which is 11/16 inch and below is short staple. The quality-wise distribution of cotton crop is as follows: (*a*) 7/8 inch and above 17 p.c.; (*b*) below 7/8 inch and above 11/16 inch 50 p.c.; (*c*) 11/16 inch and below 23 p.c.

Areas of short-staple	*Areas of long-staple*
M. P., Berar, Khandesh, Madhya Bharat, Rajputana, U. P.	Gujrat, part of Kathiawar, Southern Bombay, large portions of Madras.

The area under cotton in the Indian Union in 1950-51 was 13·8 million acres and production 2·9 million bales (of 400 lbs. each) consisting of long-staple 5 lakhs, medium-staple 17 lakhs and short-staple 10 lakhs. The home production of long-staple

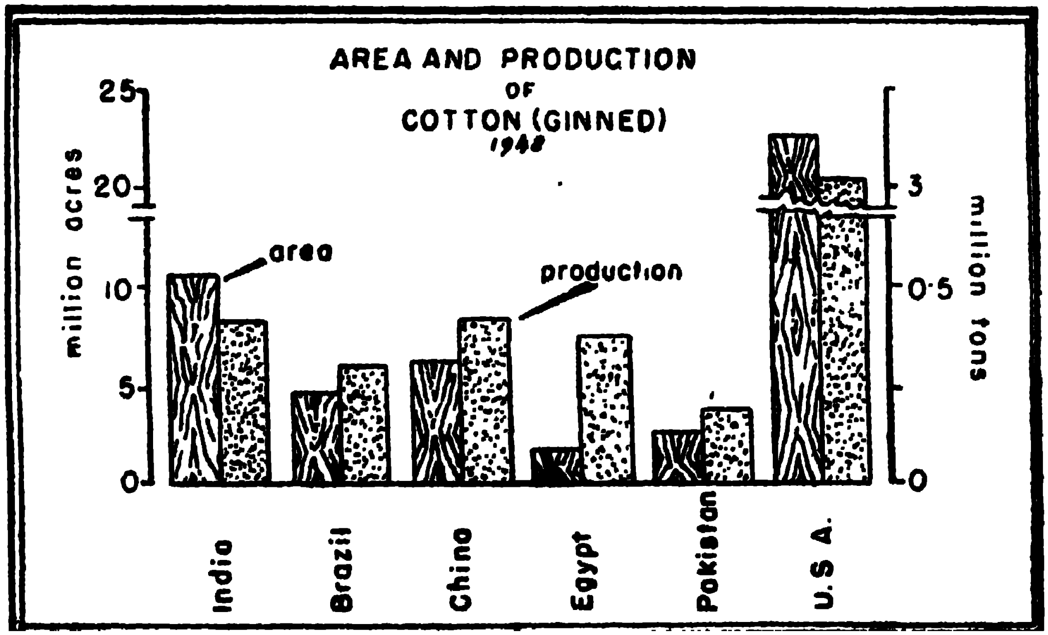

FIG. No. 111.

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* The commercial varieties of Indian cotton are known as Bengal, Americans, Oomras, Surti and Dholleras. About one-third of the Indian cotton belongs to Oomras variety.

cotton is not sufficient for mill requirements and India has to import 1½ million bales of long-staple cotton annually.

The Central Cotton Committee is engaged in improving cotton cultivation in India. The Committee raises a cess of two annas a bale on all cotton produced in India to meet its necessary expenses.

Indian cotton, being for the most part short-stapled, is unsuitable for the manufacture of cloth of higher counts such as that turned out by the Lancashire mills.

Before the partition, India was the second largest cotton-exporting country in the world. The chief consumers of Indian raw cotton were Japan, United Kingdom, Italy and China. Japan occupied the most dominant position among the consumers of Indian cotton, taking more than 60 per cent. of India's total export of cotton. This was due to the gradual development of cotton industry in that country. Japan was not in a position to grow cotton and depended for her supply of the raw material partly on India and partly on the U.S.A. Among the European countries, Germany used to take large quantities of Indian cotton before the World War II. The export of raw cotton has now greatly declined because of the *partition*. In 1951-52 India exported 23,000 tons of raw cotton against 15,000 tons in

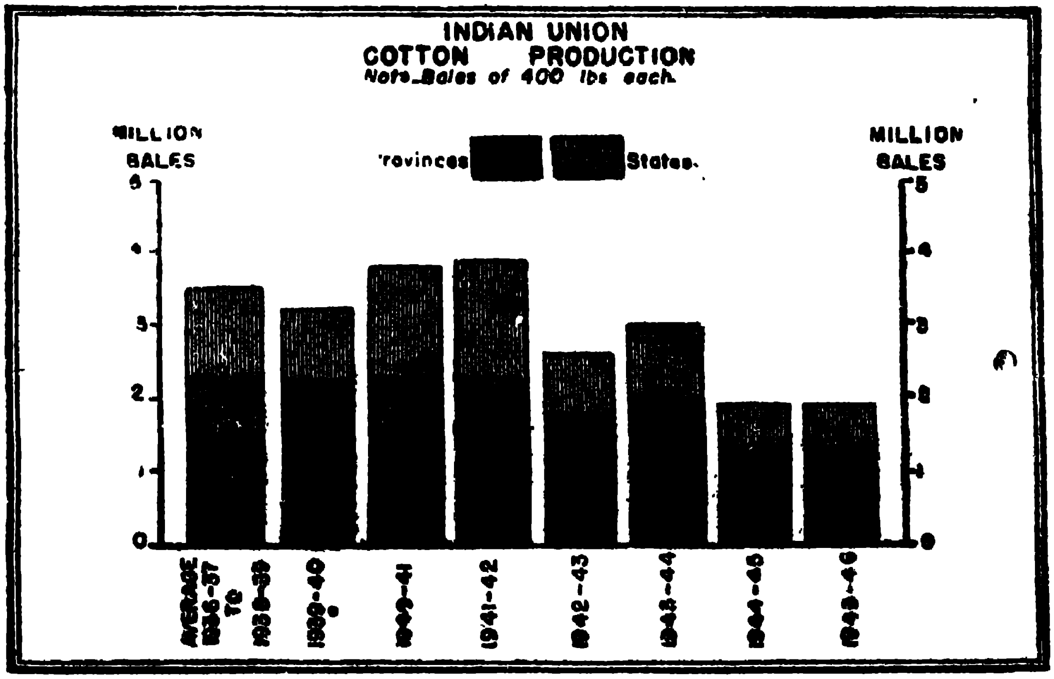

FIG. No. 112. Note the decline in cotton production after 1944-45. The peak production was in 1941-42.

1950-51. The important buyers of Indian cotton are U. K., Japan, U. S. A., Australia, New Zealand, Holland, Belgium, France and Germany.

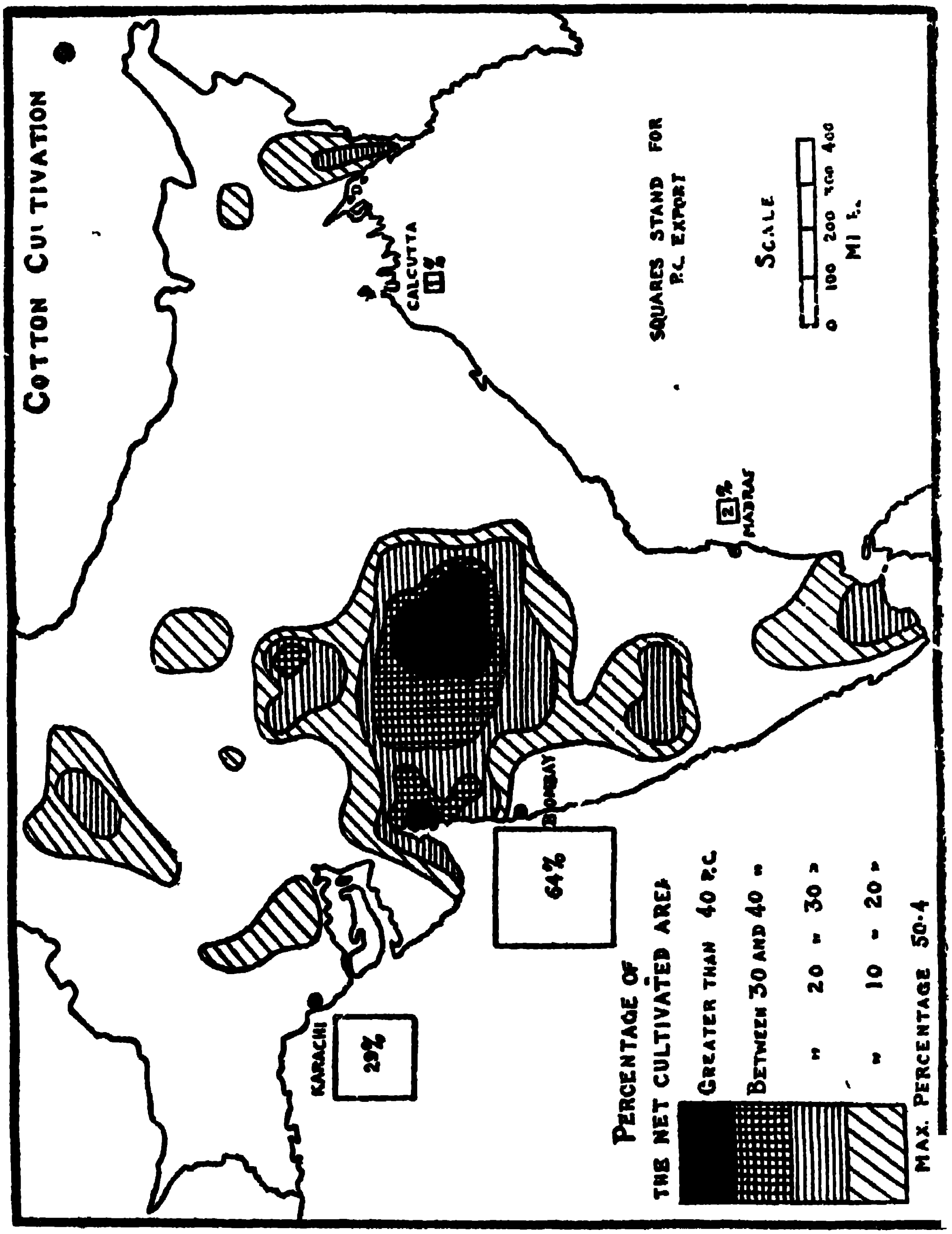

FIG. No. 113. Cotton cultivation is mostly confined to the *Black Soil* region of the Deccan comprising southern Sourashtra, Madhya Pradesh, Berar and Hyderabad.

Raw cotton occupies an important place in the Indo-Pakistan trade agreement. According to this agreement, Indian Union cannot now export cotton. Pakistan, on the other hand, has become one of the leading raw-cotton-exporting countries in the world. Indian Union imports long-stapled cotton from Pakistan.

The need for increasing the cultivation and production of cotton in the country is indeed great. India cannot now afford to spend foreign exchange for the purchase of raw cotton. There is considerable scope for cotton cultivation in Rajasthan, Madhya Bharat and Madhya Pradesh.

Oil-seeds. The trade in oil-seeds is very recent in India. Oil-seeds are in demand not only for salads and food, but for preparing medicines, perfumeries, varnishes, lubricants, candle, soap manufactures and other purposes. The principal oil-seeds found in India are linseed, groundnut, cotton-seed, rape-seed, castor, sesamum-seed, copra, mowra-seed and poily-seed.

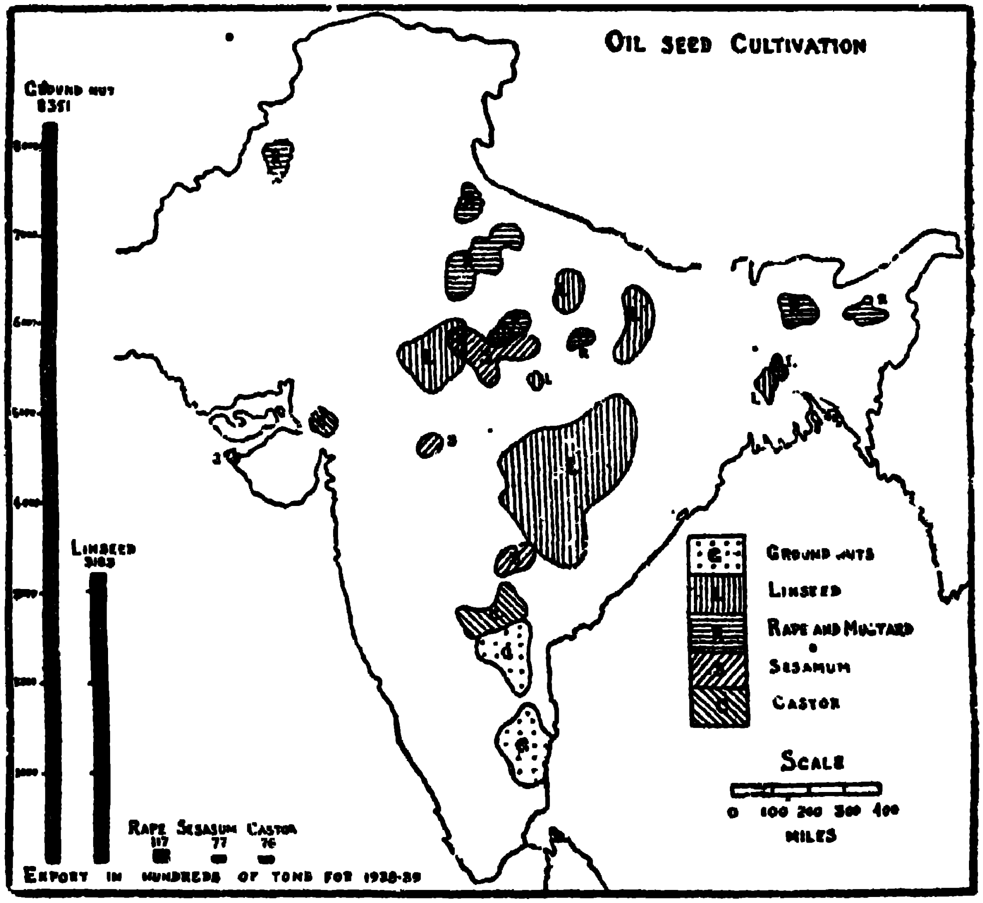

FIG. NO. 114. Distribution of oil-seeds in the country. The groundnuts are practically the products of the Peninsular India.

India is one of the leading oil-seed producing countries of the world. With the exception of palm kernels, olives and soya beans, she raises all the principal oil-seeds for world trade.

A large quantity of seeds is exported annually and this export forms a big item in India's foreign trade, and it occupies the fifth place among the exports. It is felt that India does not yet make the best use of her oil-seeds resources, though attempts have been made to develop local oil-crushing industry.

During recent years, however, our exports have considerably declined in respect of oil-seeds. The increased demand for oil-seeds in the country for cooking and industrial uses such as Vanaspati, soap manufacture, varnishes and lubricants is mainly responsible for the decline in exports. Secondly, Brazil, Argentina and the United States of America have increased their production of oil-seeds and therefore compete with Indian products in the foreign market. Thirdly, Indian castor-seed has failed to compete with the Brazilian counterpart while exports of linseeds have come down due to the inability of India to offer it at attractive prices *vis-a-vis* Canada and South American countries.

PRODUCTION OF OIL-SEEDS*

(in 000 tons)

Seeds	World production	Indian production (1948-49)	Indian production as p.c. of World production
Groundnut	... 5,000	3,073	61·5
Sesamum	... 1,100	295	26·8
Castor	... 500	109	21·8
Rape seed	... 4,800	726"	15·1
Linseed	... 2,900	439	15·1

Oil-seeds occupy about 8 per cent. of the net area sown under all crops, and the production exceeds seven million tons annually.

It is necessary to stimulate further production of oil-seeds in the country in order to meet the increased demand for local consumption as well as for earning foreign exchange by export.

But since there is also the urgent need for exploiting all available lands for food crops, the increase in the production of oil-seeds will have to be made either in lands which are not usually suitable for food crops or in off seasons. Thus, in Bombay and Uttar Pradesh (United Provinces) it is possible to grow the early variety of groundnuts before the *rabi* crops. In Madras groundnuts and Til-seeds can pe cultivated immediately after the paddy crops. In Mysore, an increase in the production of groundnuts is likely in the cotton belts. There are also great possibilities of developing groundnut cultivation in the Punjab (East Punjab) and PEPSU.

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* The Indian Central Oil-seeds Committee (1949).

At present, the demand for oil-seeds arises mostly for making oils and fats (edible oil). Efforts should also be made to use more and more non-edible seeds like mohwa, neem, Karanga and castor for industrial purposes to relieve the demand on edible seeds for similar purposes. It may be possible to get oil out of sal-seeds in Orissa.

Linseed. India is the second largest linseed-producing country in the world. Although it is one of the oldest fibre plants of India, linseed is cultivated for its seeds only. The plant requires the same kind of land as wheat and is grown as

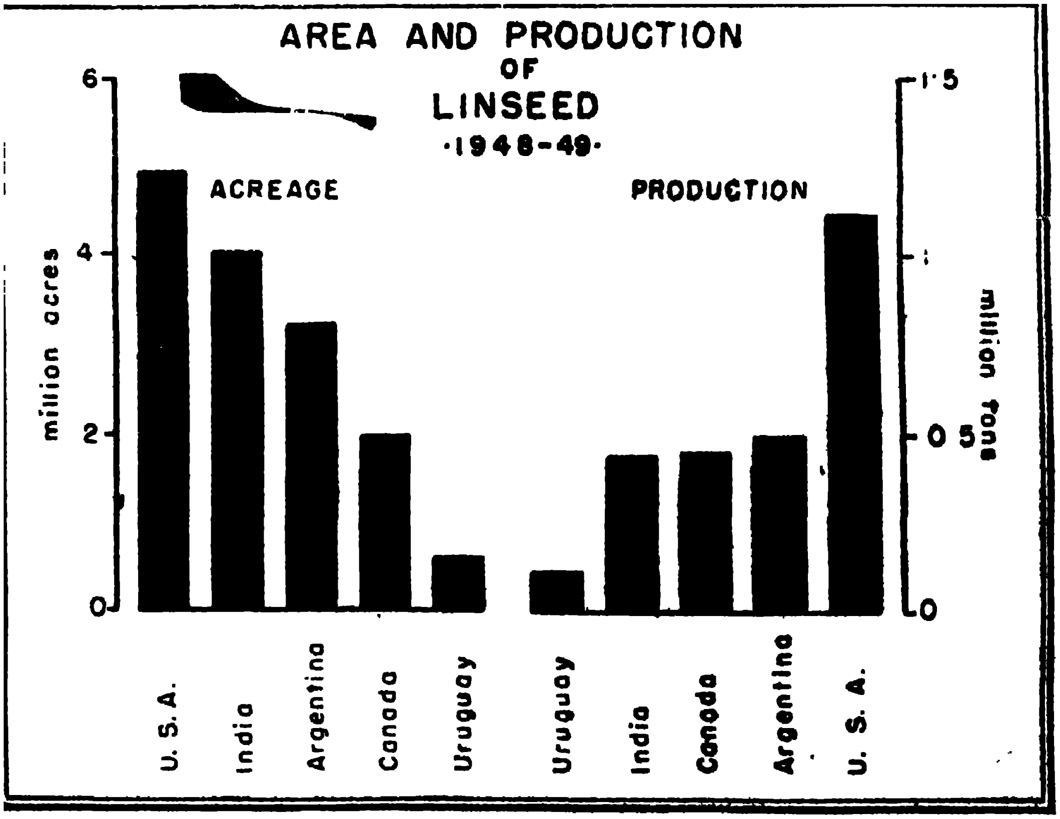

FIG. No. 115.

soon as the monsoon is over. The harvesting begins in February.

Linseed is mainly a rain-fed crop. The average rainfall between 30 and 70 inches per annum is best suited for its cultivation. Linseed is cultivated for its seeds mainly in Madhya Pradesh, Bihar, Orissa, the Uttar Pradesh, Bombay and West Bengal. It is also cultivated in Hyderabad, the East Punjab and Kotah. The Uttar Pradesh is the leading producer followed by Bombay.

AREA UNDER CULTIVATION OF LINSEED

	1949 Area	Yield in 1949 (in 000 acres)
Madhya Pradesh	1,116	97
Uttar Pradesh	177	161
Bihar	374	71
Madhya Bharat	397	22
Rajasthan	221	10
Hyderabad	474	43
Vindhya Pradesh	168	25
Total Indian Union	3,125	432

In 1950-51 India exported 68,000 tons of linseed valued at Rs. 5·6 crores. Half the quantity was taken by Japan. India exported 6 million gallons of linseed oil valued at Rs. 5·6 crores in 1952. The United Kingdom, France, Belgium, Italy and Holland are other buyers.

Bombay handles two-thirds of the total exports of linseed.

As regards exports, Argentina is a formidable competitor of India.

Rape-seed, the Indian name of which is *Sarson,* is grown with wheat. It is often confused with mustard (Rye). Its cultivation is restricted to the northern part of India, and the principal areas are the Uttar Pradesh, West Bengal, East Punjab, Bihar and Orissa. The Uttar Pradesh alone supplies more than 50 per cent. of India's total. Rape-seed is exported to the United Kingdom, Italy, Belgium and France.

Groundnut. India is the largest groundnut-producing country in the world followed by French West Africa, China,

U. S. A. and Indonesia. It is essentially a tropical product and as such is grown extensively in peninsular India. The crop is sown in May-August and is harvested in November-January. It is grown mostly in Madras, Bombay, and Hyderabad.

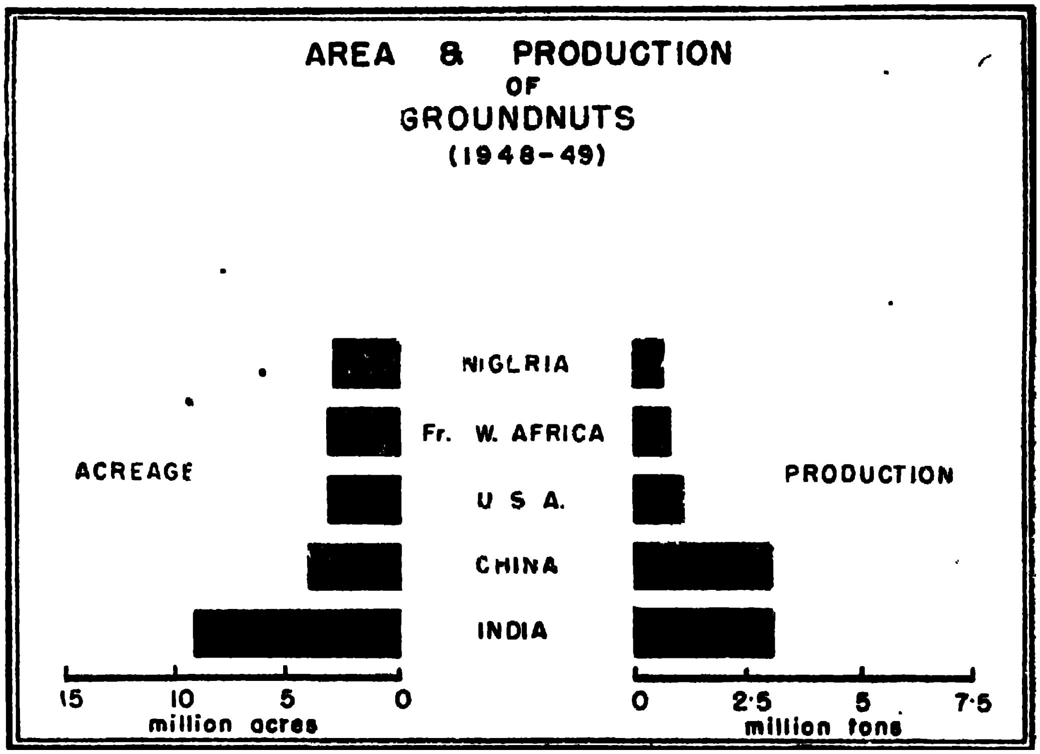

FIG. NO. 116. The production in 1950 almost reached the level of 1928-29.

Recently groundnuts have been introduced in Central Province and Chotanagpur.

PRODUCTION OF GROUNDNUTS IN 1949-50

	Area (in 000 acres)	Yield (in 000 tons)
Madras	3,863	1,646
Bombay	1,934	731
Madhya Pradesh	675	163
Hyderabad	1,619	406
Mysore	272	41
Total India	8,363	2,987

In 1951-52, India exported 20,000 tons of groundnuts compared to 126,000 tons in 1949-50, which in terms of value came to Rs. 2·3 crores in 1951-52 and Rs. 9 crores in 1949-50. Bombay handles three-fifths of total exports of groundnuts followed by Madras and Cutch ports.

The export of groundnut oil has increased considerably. In 1951, India exported groundnut oil worth Rs. 16·7 crores. Normallly the principal buyers are Canada, Switzerland, France, Belgium, Germany, Italy and the United Kingdom.

Sesame seed. The cultivation of sesame in India dates back earlier than the Christian era. India is the largest sesame-producing country in the world. The Uttar Pradesh is the leading producer. In 1948-49, there were 4 million acres of land under Sesamum cultivation.

The plant is grown on light and sandy soils, although some of the varieties in India do well on the black cotton lands. The seeds are exported to the United Kingdom, France, Belgium, Germany, Italy and Egypt.

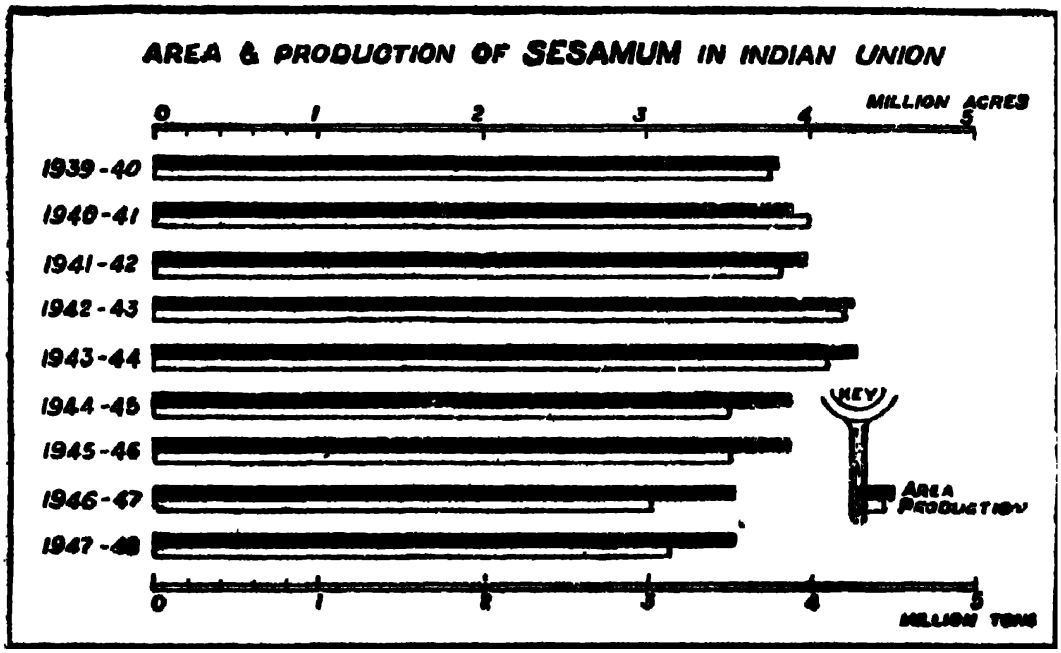

FIG. No. 117. Note the gradual decline in acreage.

Its importance as an article of export has declined considerably. The Indian Union exported only 33 tons of Sesamum seed and 3 gallons of sesamum oil during 1948-49 as against 886 tons and 876 gallons respectively during 1947-48.

Castor seed. India holds a virtual monopoly in the production of the castor seed, although small quantities are also cultivated in Manchuria, Indo-China, Brazil and Java.

The castor plant requires warm climate. "A fair amount of moisture and rainfall after sowing is essential to ensure good germination ; but after the root system has developed, less moisture is needed." It does well on land where maize is cultivated. The plant acquires a height of 20 to 30 feet.

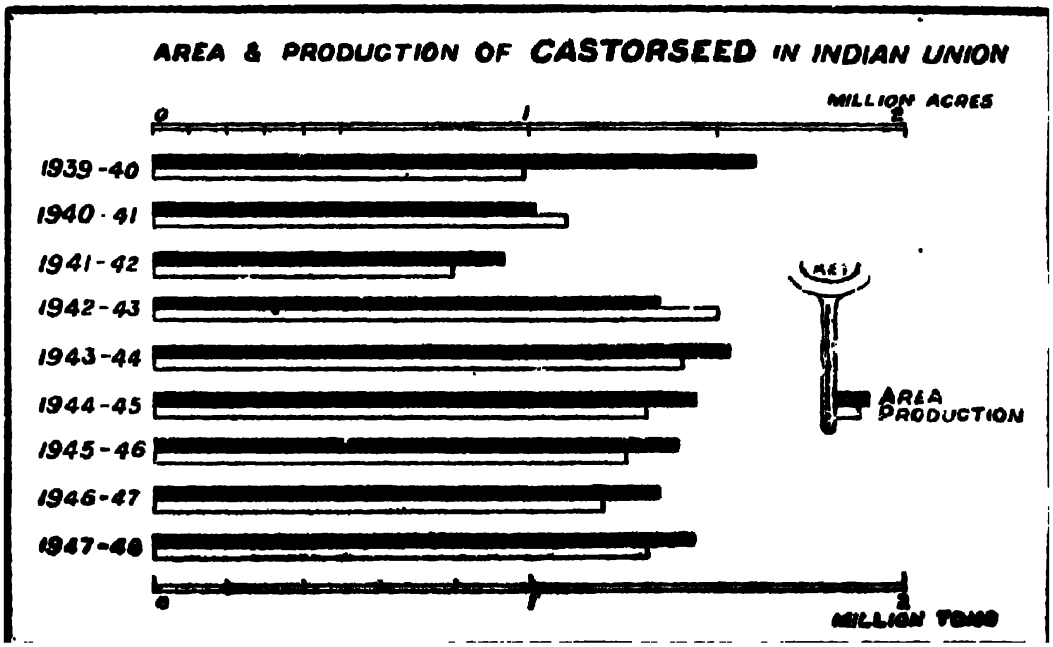

FIG. NO. 118. Note the sudden rise in production in 1942-43. The annual average production of castor seed is 1·2 million tons.

The plant is cultivated chiefly in Madras, Hyderabad, Bombay and Madhya Pradesh. A little above 1 million acres of land is under castor plants in India.

India does not now export castor seed. Export of castor oil, on the other hand, is considerable. In 1951-52, the Indian Union exported about 6 million gallons of castor oil while in 1938-39, the exports were about 1 million gallons only. The principal buyers are the United Kingdom, France, the United States of America, Belgium, Italy, Germany, Spain and Canada.

The U. K. takes about 50 per cent. of the castor oil exported, followed by U. S. A. with about 20 per cent.

Cocoanut and Copra. Cocoanut is a very important source of vegetable oil. The tree is widely grown in islands and near the sea-sides of tropical lands. High temperature and heavy rainfall on alluvial lands are the ideal conditions for its growth. The tree takes 5 to 10 years to mature after which it continues bearing fruits for about 80 years. Each tree yields on an average 50 to 70 fruits per year. The chief products of the cocoanuts are copra and coir fibre.

Copra is the commercial name for the kernel of the cocoanut, broken into small pieces and dried in the sun. The kernel of the cocoanut contains oil, which is an important article of commerce. This oil is edible and used for cooking purposes and for the manufacture of margarine and other butter substitutes.

There are 1·5 million acres of land under cocoanut cultivation in India. Madras, Travancore, Cochin and Mysore account for the bulk of the cocoanut acreage, while Orissa, Bombay, West Bengal and Assam also contribute to it. In Madras, three-fourths of the acreage under cocoanut are in the districts of Malabar and South Kanara and East Godavari. In the Travancore State, the cocoanut tracts are found in the lowlands and the middle area. Cochin State raises the tree mostly on a narrow strip of sandy tract on the western sea-board. The biggest cocoanut areas of the Mysore State are found in Tankur district followed by Hussan, Mysore, Chitaldrug and Kadur. In Orissa, the greatest concentration of cocoanut tracts is in the districts of Puri and Cuttack. The two districts of Ratnagiri and Kanara contain nine-tenths of the cocoanut acreage of Bombay.

The cocoanuts are important in India for a variety of purposes. Tender nuts are in demand for the milky fluid inside, which provides a refreshing drink. Mature nuts are used mainly for four purposes: (*i*) for making copra, (*ii*) for religious offerings, (*iii*) for edible purposes as fresh kernel, and (*iv*) for raising seedling.

About 45 per cent. of India's production of mature nuts is utilised for making copra, while an equal quantity is used also for edible purposes such as curries, chutneys, sweets, puddings etc.

Cotton seed. The importance of cotton seed as a source of oil was not fully appreciated till late in the 19th century. The oil is used in cooking, in pharmacy, in the preparation of lard and margarine, and as a substitute for olive oil.

Bombay, the East Punjab, Madhya Pradesh, Hyderabad and Madras are the chief producers. The total yield of cotton seed in 1937 was a little above 2 million tons.

Other seeds raised in India include poppy seed, mowra seed and niger seed.

Rubber. Rubber plantation was first introduced in India in 1902 on the banks of Periyar in North Travancore.* The industry continued to develop till 1929 when the world-wide trade depression put a stop to further expansion. With the fall of the East Indies (now Indonesia) and Malaya—the leading rubber producing area in 1942,—the Indian rubber industry revived its activities.

Indian Union produces about 35,000 tons of rubber annually. Of the Indian production, not more than 50 per cent. is first grade rubber, the rest being lower grades. Rubber is mainly grown in the southern part of India. Madras, Coorg, Mysore, Travancore and Cochin are the principal producers of rubber. About 170,000 acres of land were under rubber cultivation in 1951.

P. C. OF TOTAL AREA UNDER RUBBER CULTIVATION

Madras	10 p.c.	Cochin .. .	8 p.c.
Travancore	60 p.c.	Coorg & Mysore ..	2 p.c.

In Southern India, communications are well developed, and there is never any scarcity of labour in the plantations. The rubber plantations employ more than 30,000 people in India.

Indian rubber is mostly raised for foreign markets. The principal recipients of Indian rubber are the U. K., Ceylon, Holland, Straits Settlements and Germany. The United Kingdom alone takes more than 35 per cent. of our rubber export. Cochin is the principal port through which rubber is exported.

The International Scheme for the regulation of production and export of rubber came into operation on the 1st June, 1934.

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* The credit of initiating the cultivation of rubber in India belongs to the late Marquis of Salisbury when Secretary of State for India in 1900. The seeds secured in South America—*Amazon Para Rubber*—were sent here for the purpose of introducing the industry. Vide *Empire Stock Taking* by Grondona (1930).

The scheme had its aim to regulate the production and export of rubber in order to reduce existing world stocks and maintain an equitable price level, reasonably remunerative to efficient producers.

During the Second World War, the Government of India stopped all exports of rubber and itself purchased the entire output. After the war, the rubber planters of Indian Union find themselves in sorry plight. The cost of production of Indian rubber being higher than the imported raw rubber, the Indian growers demand that there should be embargo on rubber import again.

The rubber manufacturing industry of India is capable of absorbing our entire raw rubber. But so long as the entire range of rubber goods now imported by India is not made here, embargo on import of rubber will make the manufacturing industry consume less.

The Indian Rubber Board which is constituted under the provisions of the Rubber Act 1947 is concerned with the production and marketing of the rubber industry. The Board also advises the Government on matters relating to imports. The price of rubber produced in the country is fixed statutorily. The Board is financed by a cess levied on all rubber produced in the country and fees levied for licences issued to dealers and manufacturers.

IRRIGATION WORKS

As India is essentially an agricultural country, the need for a sufficient supply of water is always great. The *Monsoon* usually supplies water to Indian districts ; but there are certain drawbacks in the character of the monsoon. These are :

(*i*) Uncertain rainfall : In Rajputana and many parts of the East Punjab rainfall is uncertain.

(*ii*) Ill-distribution : In the Deccan, rainfall is not only scanty but ill-distributed.

(*iii*) Absence of winter rain : Cultivation in winter requires artificial water-supply in the absence of winter rain.

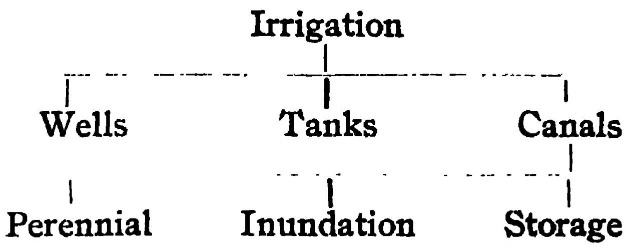
(*iv*) Certain crops require more water than rainfall can supply, *viz.*, sugar-cane and rice.

Man is unable to control rainfall in which either deficiency, irregularity or super-abundance may give rise to disastrous famines. He can, however, provide measures which reduce famines. The chief among these is the extension of irrigation. Irrigation means supply of water to the fields by means of canals from rivers or from storage tanks for the purposes of agriculture. Irrigation has been practised in India since time immemorial.

Irrigation has played a very important part in the rural economy of the different provinces of India. Irrigation is necessary in all parts of the country where the mean annual rainfall is less than 50 inches. This applies to Rajputana where the rainfall is less than five inches in a year, to Uttar Pradesh, parts of Madhya Pradesh, Bihar and Orissa and over the whole of the Deccan Plateau, except a range along the western coast.

The area irrigated in Indian Union is about 47 million acres of which grain crops occupy more than 30 million acres. This is the largest area which is irrigated in any country of the world.

There are three main kinds of irrigation works in India :



(*i*) WELLS : About 20 per cent. of the total irrigated area in India is irrigated by means of wells. The construction and maintenance of wells have been mainly the result of private enterprise. Water is raised from wells either by manual labour, bullocks, water-lifts, the Persian wheels or by means of oil engines. Well-irrigation is extensively used in the Uttar Pradesh, the East Punjab, Madras, Bombay, Rajputana, etc. Irrigation through surface percolation wells is fairly common throughout the East. One of the disadvantages of irrigation by wells is that the water has no fertilising property in itself unlike the canal water which carries large quantities of fertilising silt to the fields they irrigate. It is therefore necessary to use manure on soil, irrigated by wells. The Government of India and the State Governments are now supplying manures, both organic and artificial, for securing maximum yield of crops from the fields irrigated by wells.

(*ii*) TANKS : Tanks are really hollows, natural or artificial, in which rain water is collected and stored up. Tank irrigation is prevalent in Madras, Mysore and Hyderabad. Nearly 8 million acres of land are irrigated by Tanks.

(*iii*) CANALS : This is the most important type of irrigation in India. Canals may draw their water either from rivers or from artificial storage. Canals are mostly constructed in Northern India, where the rivers have flow of water throughout the year. Storage canals are constructed in the Deccan, Madhya Pradesh and Bundelkhand. Here the rivers dry up during the hot season and, therefore, artificial storage is necessary. Rain water is stored across a valley by building a dam and then distributed to the neighbouring lands by means of canals. About 20 million acres are irrigated through canals.

River canals may be of two classes : (*a*) Inundation canals and (*b*) Perennial canals. The inundation canals obtain water when the river rises above a certain level. Thus the canals depend for their supply of water on the natural flood level of the river. When the level is low, canals do not obtain water, but when the river is in flood, they permit widespread cultivation. Irrigation is thus suspended from October to April when the level of the water is low. During this period cultivation is practised with the help of well-irrigation. To remedy this defect perennial canals are constructed.

The perennial canals draw their water from rivers which have their flow of water throughout the year. Some form of barrage is put across a river and its water is diverted by means of canals to the neighbouring areas. The great canal systems of the U. P. are of this type. Many of the inundation canals are being transformed now into perennial canals. By perennial irrigation, agricultural production in the "uncertain zone of rainfall" has been enormously increased, for unlike the inundation method it allows full advantage to be taken of in the hot season and so permits cultivation all the year round.

The conditions are excellent for developing irrigation in the East Punjab. The province is flat, with soft alluvial soil. The development of canal irrigation has transformed large areas of semi-deserts into fertile agricultural lands.

The important canal systems in the East Punjab are:

(*i*) The Western Jumna Canal takes its water from the Jumna river and irrigates the districts of Rohtak and Hissar (South-East) and the States of Patiala and Jhind. More than 8,90,000 acres of land are irrigated by 1900 channels of the Canal.

(*ii*) Sirhind Canal takes its water from the Sutlej river at Ruper and irrigates the districts of Ludhiana, Ferozepur and Hissar, and Nabha. The canal was opened in 1862, and for many years after suffered very seriously from the most aggravated form of silt trouble. Slowly, the headworks were modified to overcome the difficulties. Today, this canal is one of the most stable in all India.

(*iii*) The Upper Bari Doab Canal takes its water from the Ravi river at Madhopur and irrigates the districts of Gurdaspur and Amritsar. This canal is extended to Pakistan. In winter the supply of water in Ravi is not sufficient for the requirements of Upper Bari Doab Canal and for months together not a drop is allowed to pass below Madhopur.

In Madras about 7 million acres of land are irrigated by tank-canals. The percentage of the area irrigated to the total area sown in Madras exceeds 30. Canals take their water from the Godavari, Kistna and Cauvery. The Periyar canal system is one of the best examples of irrigation that exist in Southern India. The flat land around Madura covering an area of 1,33,000 acres, is watered by the Periyar river.* The Mattur irrigation system on the Cauvery river is the biggest in the Union and "the largest single block masonry reservoir in the world with a storage capacity of 93,500 million cubic feet".

The prosperity of the Uttar Pradesh is largely due to the great irrigation works. Irrigated regions cover nearly 22 per cent. of the area sown. Rainfall in the Upper Ganges valley is under 40 inches and irrigation is of vital importance. There are five large canal systems in the province.

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* The Periyar is a small river in the Western Ghats of the Madras Presidency whose water is drawn to the eastern part of the hills by means of a tunnel.

(*i*) The Upper Ganges Canal was completed in 1854 and has its headwater at Hardwar. It irrigates over 1,00,000 acres of land and is the most important system of the province. The main canal is 213 miles long with branches and distributaries totalling 3,400 miles. It also supplies water to the Agra canal and the Lower Ganges canal.

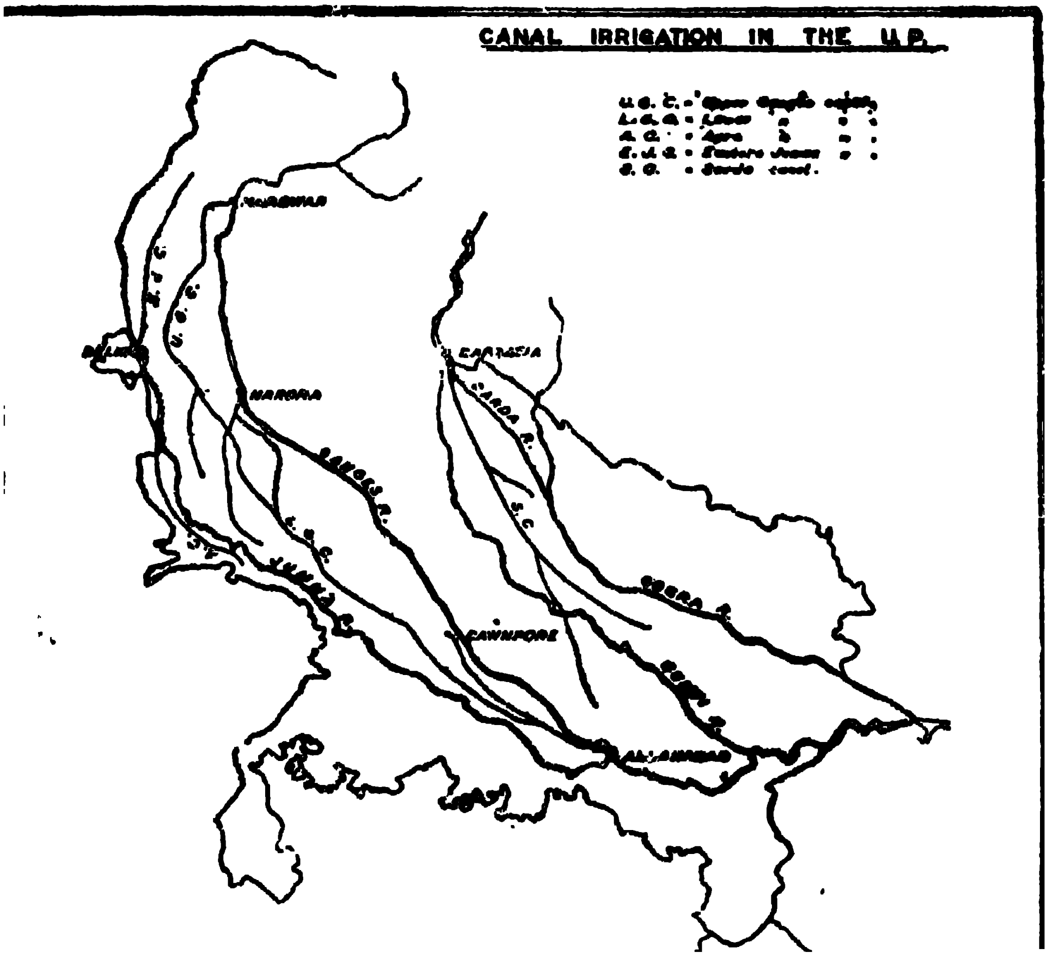

FIG. No. 119. Note the absence of irrigation in the south-west of U.P.

(*ii*) The Agra Canal was opened in 1874 and is taken off from the Jumna near Delhi. It irrigates over 2,60,000 acres of land.

(*iii*) The Lower Ganges Canal was completed in 1878. It is taken off at Narora in the district of Bulandshahr. The total length including channels exceeds 3,000 miles. It irrigates over 8,00,000 acres of land.

(*iv*) The Sarda Canal is the largest productive canal of the province. It was completed in 1928. Its mileage including distributaries is over 5,500. The headworks are situated at Banbansa on the border of Nepal. It irrigates Rohilkhand and the western part of Oudh. The Sarda system commands an area of about 60,00,000 acres of land.

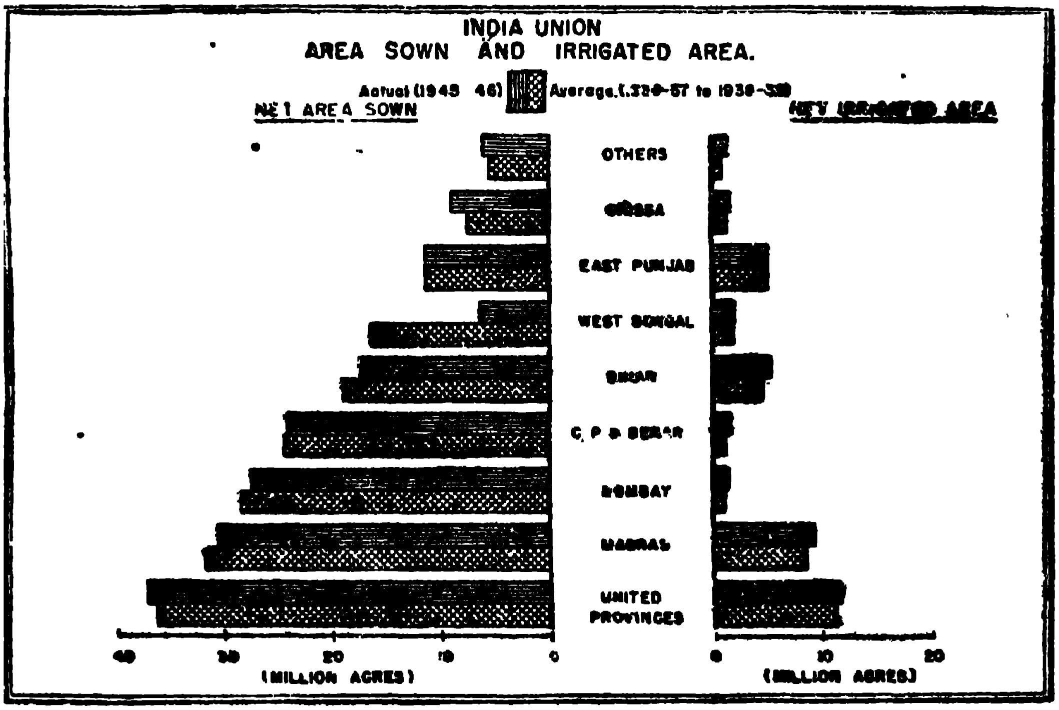

FIG. No. 120. Note the importance of irrigation in U.P.

(*v*) The Eastern Jumna Canal serves the north-eastern part of the province. The canal takes the water from the Jumna near Faizabad.

The progress of irrigation in India is not rapid. Irrigated areas cover only 18 per cent. of the total sown area in India. There is a great scope for irrigation in West Bengal, Bihar, Orissa, southern Uttar Pradesh and the whole of Peninsular India.

In West Bengal, only about 2,75,000 acres are irrigated by canals out of the total cultivated area of 12·1 million acres. The need for irrigation facilities is urgent as at many places in the districts of Birbhum, Bankura, Burdwan and Midnapore, the rainfall is much below the quantity required for cultivation.

THE EXTENT OF IRRIGATION IN INDIA

	P.c. of cultivated area to total area	P.c. of irrigated area to cultivated area	P.c. of irrigated area to total area
Madras ...	46	26	12
U. P. ...	68	27	18
Bombay ...	61	4	2
Bihar ...	52	22	12
Mysore ...	35	16	6
Orissa ...	34	22	8

As extension of the canal system involves heavy cost for construction, its development will depend on the Government policy and the state of finances.

The Multi-purpose Projects

Although India leads the world in irrigation, there is urgent need for further extension of irrigation facilities to many areas to step up production of food which has of late fallen below requirements. It has been estimated that out of the total quantity of water available in the rivers of the country and the subsoils only six per cent. has so far been utilised for irrigation and the rest runs to waste and in its progress to the sea does incalculable damage to life and property through uncontrolled floods. On a rough calculation the mean annual supply of water in the rivers of India is of the order of 2·3 million cubic feet per second. The mean annual utilization of water for agricultural and other purposes through canals is roughly 133,000 cubic feet per second.

Recently several projects have been undertaken by the Central and Provincial Governments for power and irrigation in India. *The projects are being so designed as to provide not only for irrigation, but also for hydro-electric power, flood control, navigation, recreation facilities and fish culture. Hence these projects are also known as multi-purpose plans.* After the completion of these plans, India will be using about 10 p.c. of her latent water-power capacity, and about 28 million acres of land will become available for cultivation.

For the purpose of planned development, India can be divided into the following river basins:

(*i*) The river-system of East Punjab which was formerly part of the Great Indus basin.
(*ii*) The Central Ganges basin between its source and the eastern borders of the Uttar Pradesh.
(*iii*) The Eastern Ganges basin drained mostly by its northern tributaries.
(*iv*) The Brahmaputra system of Northern Assam.
(*v*) The Hooghly basin which comprises parts of Eastern Bihar and almost the whole of Western Bengal.
(*vi*) The Orissa river system bounded on the north by the watershed of the Subarnarekha and on the south by the Mahanadi.
(*vii*) The Godavari system with its tributaries draining into the Bay of Bengal.
(*viii*) The Krishna system which covers some of the dry districts of Central and Eastern Madras. The Krishna Dam site is near the confluence of the Krishna and the Tungabhadra.
(*ix*) The Cauvery System.
(*x*) The Madhya Bharat river system of the Tapti and Narbada.
(*xi*) The Malwa river system skirting the Eastern borders of Rajputana and centring round the Chambal which drains to the Jumna.

For the development of some of these river-valleys, the Central Government have in hand the following multi-purpose projects :—

(*a*) The Damodar Valley Project (of the Hooghly basin).
(*b*) The Koshi Project (of the Eastern Ganges basin).
(*c*) The Hirakud Project (of the Orissa river system).
(*d*) The Tapti-Narbada Project of Madhya Bharat.
(*e*) The Rihand Project.
(*f*) The Tungabhadra Project.

The estimated cost of the six projects is Rs. 232 crores and these will irrigate 12 million acres of land.

These projects will not only provide irrigation and generation of electric power for industrial purposes, but will also control flood and remove malaria, foster navigation, land reclamation, fish culture, etc.

In addition, there are provincial projects like Mor river (West Bengal), Ramapadasagar (Madras), the Bhakra and Nangal project of the East Punjab. The Mor river project of Bengal will take about 4 years to be completed and will bring irrigation to 600,000 acres. The Rampada Project aims at irrigating 2·5 million acres of land.

Damodar Valley Project

The Damodar (also known as the River of Sorrows) is 336 miles long. It has its source in the Hills of Chotanagpur at an elevation of 2,000 feet. After flowing for 180 miles in Bihar it enters West Bengal and ultimately joins the Hooghly.

In its upper valley lie parts of Hazaribagh, Palamau, Ranchi, Manbhum and Santal Parganas in Bihar. Here the rainfall is about 47 inches annually, most of which fall during the monsoon. "Torrential rains crash down upon the deforested hills, and the unimpeded rain-water tumbles down the hills into the river. The unchecked flow erodes land in Chotanagpur and swells the volume of water in the river."

The lower portion of the valley lies in West Bengal, where the flooded Damodar overflows its banks, destroys crops and dwellings, carries away men and cattle, disrupts communications and dislocates temporarily the economic life of the valley.

The river can be made to work for multi-purpose development. If properly tamed, it can become a source of wealth and power to Bihar and West Bengal.

The Damodar valley project aims at providing water for irrigation and navigation, controlling malaria, introducing scientific management of land and promoting actively the economic development of the entire basin. The project will provide perennial irrigation to three quarters of a million acres and generate 300,000 kw. of power.

The upper Damodar basin is very rich in timber, lac and tussore. The lower basin though very fertile is without proper system of irrigation for which intensive cultivation is not possible. The Damodar Valley contains the largest coal deposits of India and considerable quantities of bauxite and aluminium. The valley has also fire clay, china clay, mica,

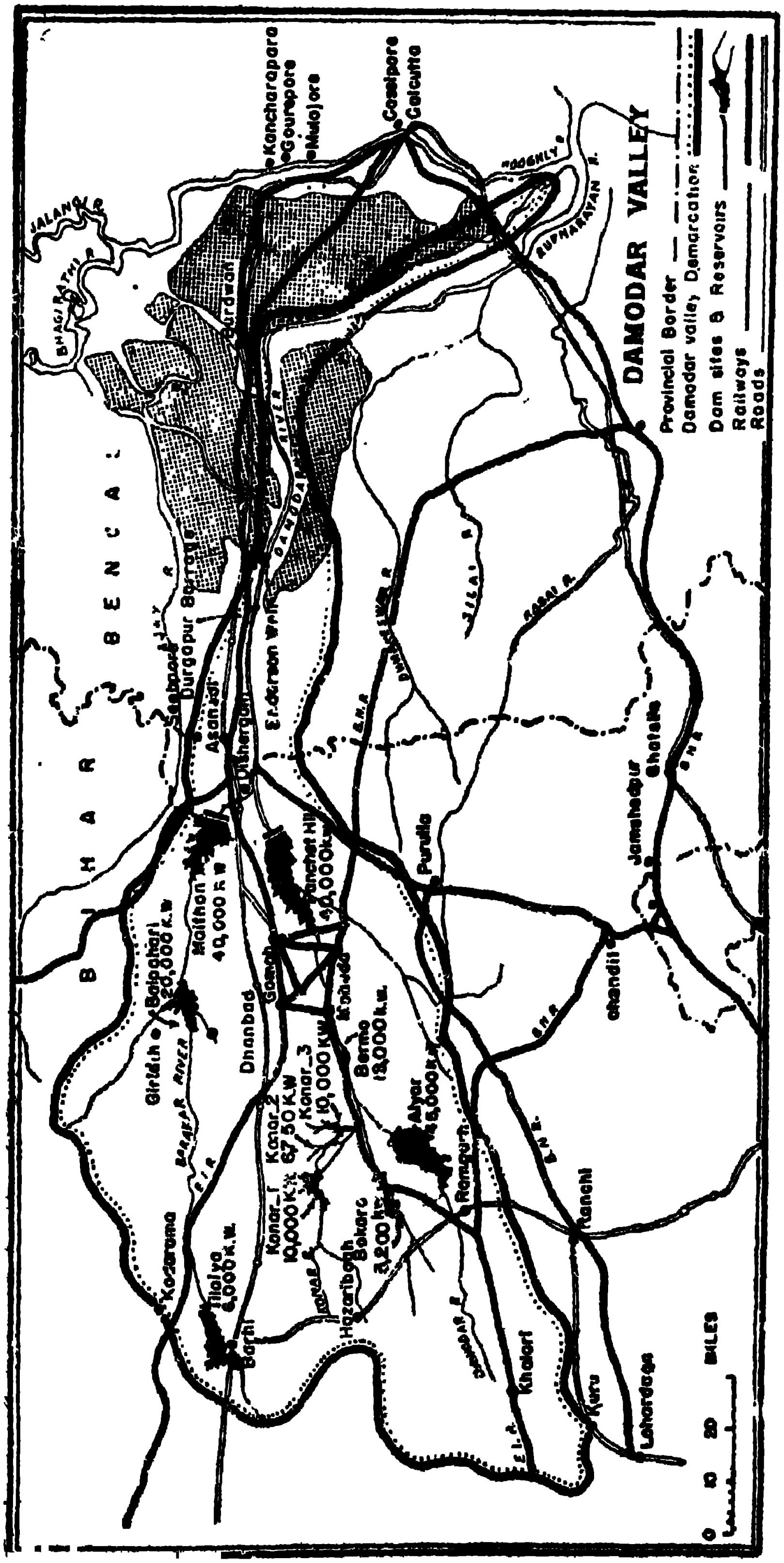

FIG. No. 121.

limestone, lead, silver, antimony and quartz. With cheap electric power, these minerals can be properly exploited.

The Government of India has set up by an Act a Corporation to implement the Damodar Valley Project. The Damodar Valley Corporation will execute and operate schemes for irrigation, the generation of power and flood control. The Corporation will also provide navigation, afforestation, public health and industrial, economic and the general well-being of the people of the Valley. The construction work has commenced.

The project envisages the construction of eight dams and a barrage. The dam sites will be located at *Maithon on the Barakar, Aiyar on the Damodar, one across the Konar, one across the Bokharo, Balpahari and Tilaiya on the Barakar and one near the Panchet Hill on the Damodar.* The barrage is to be located at Durgapur. The order in which the construction will be undertaken will depend much on the availability of plant, equipment and construction personnel. The Tilaiya dam has been built already and it will be followed by one on the Konar, one at Maithon and one at Panchet Hill.

The Hirakud Dam Project comprises the construction of a dam across the Mahanadi about nine miles upstream off the

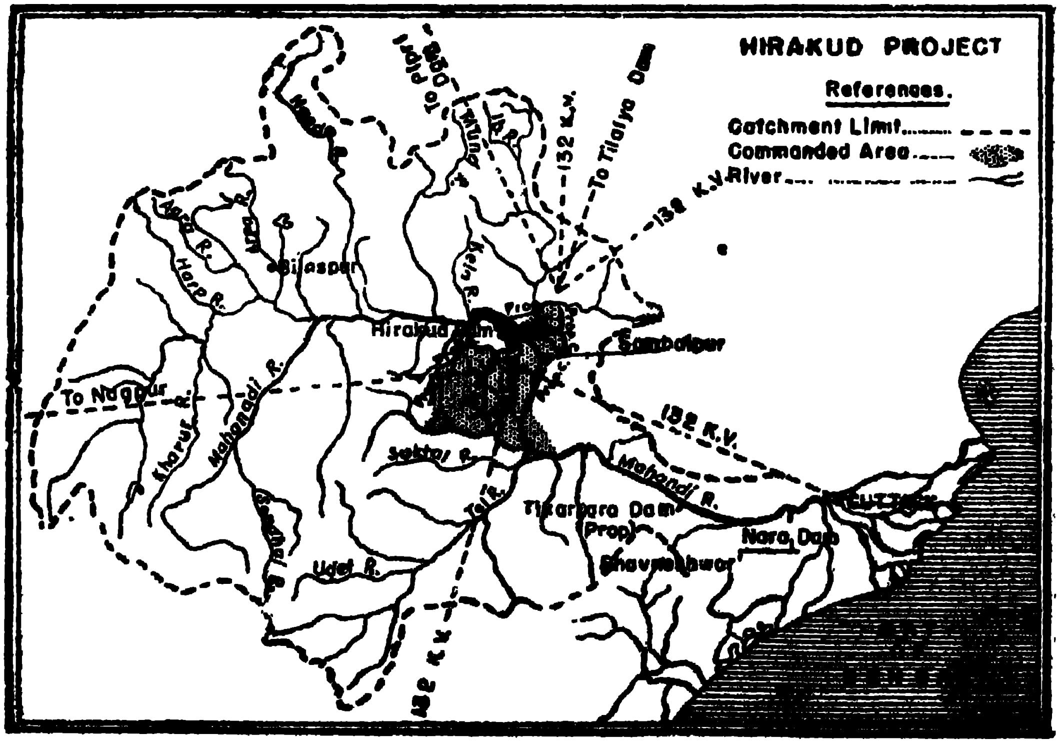

FIG. No. 122. Note the location of dams on the Mahanadi.

town of Sambalpur. There will be canals on either side and two hydro-electric installations. The Hirakud dam will be 150

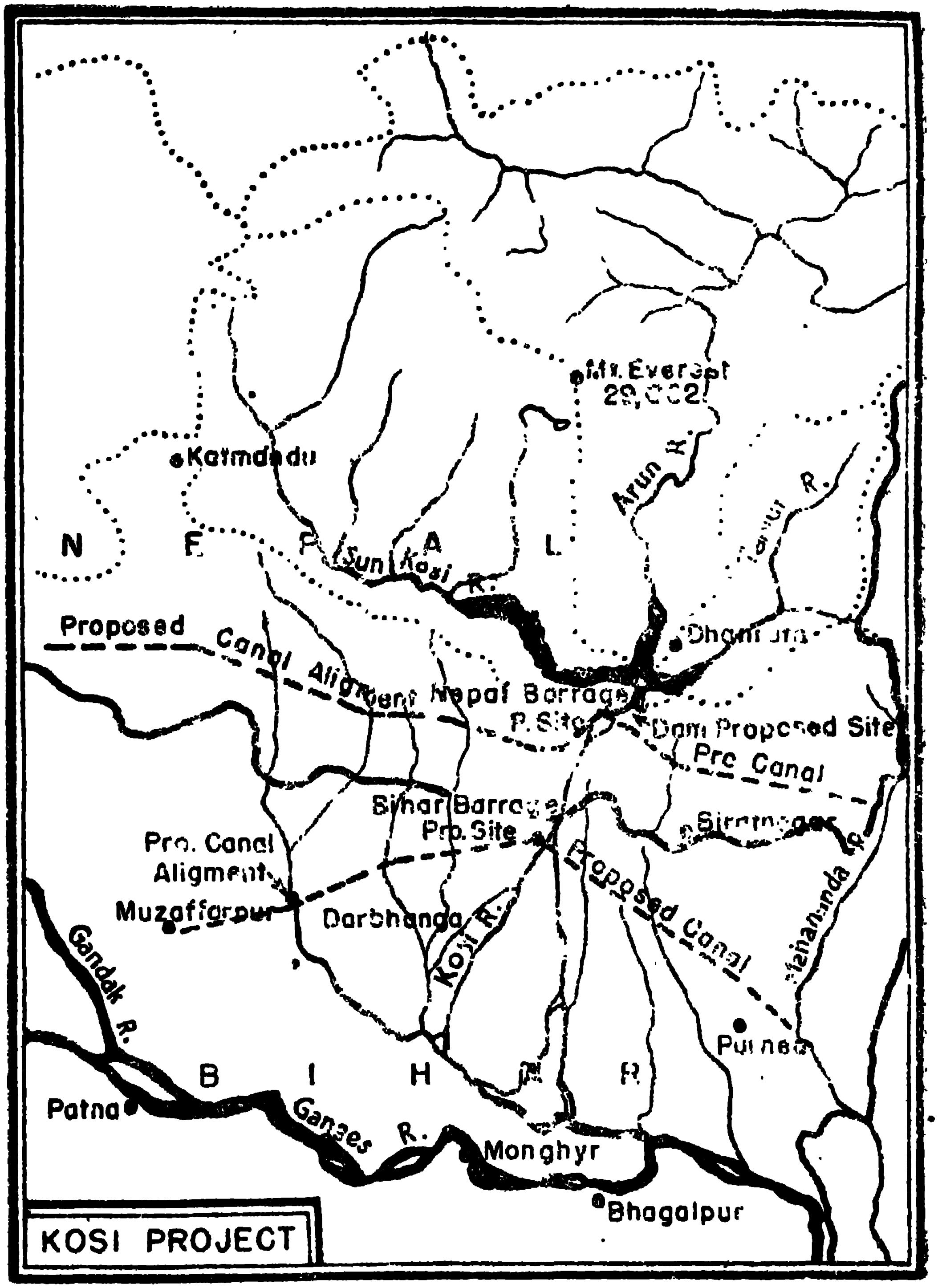

FIG. No. 123. The project will serve northern Bihar.

feet above the river-bed with gross storage capacity of the reservior of 5·3 million acre feet. Two other dams will be constructed on the Mahanadi—one at Tikarpara and the other at Naraj, a few miles west of Cuttack. The three projects when completed, will provide irrigation to 2,500,000 acres of land, generate 3,50,000 kw. and will also provide navigation facilities. The whole of the Mahanadi Valley, particularly Sambalpur district, Sonepur State and the delta region will be particularly benefited by these schemes.

The Kosi Project is the most important scheme in Bihar. It will be a multi-purpose project for irrigation, power, navigation, flood control, silt control, soil conservation, drainage, reclamation of water-logged areas, malaria control, fish culture and recreation facilities. The project will comprise a dam about 750 feet high across the Chatra Gorge in Nepal to store about 11 million acre feet of water. There will be two barrages on the Kosi:—(*a*) The first one in Nepal will control and stabilise the river channel and will divert its supplies into two canals on either side. About a million acres of land in Nepal territory will be irrigated by these two canals. (*b*) The second barrage will be near the Nepal-Bihar border, where two canals on the left and one on the right will be constructed for irrigating over two million acres in the districts of Purnea, Darbhanga and Muzaffarpur in Bihar.

The power plant at the dam site will be capable of generating 1·8 million kw. of cheap power. The project may take ten years to be completed and the cost is estimated at Rs. 90 crores.

The Tungabhadra Project comprises the construction of a dam 8,200 feet long and 160 feet high across the Tungabhadra, a major tributary of the Krishna. The reservoir will contain 2·6 million acre feet of water and will serve Madras and Hyderabad. About 300,000 acres of land will be irrigated by the scheme. The Project will also develop a small quantity of hydro-electric power in Madras.

The Bhakra and Nangal Project* is the only multi-purpose scheme in East Punjab. The industrial development of East Punjab is at present very retarded by the shortage of power.

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* Though conceived in 1909, it was not until 1946 that the Bhakra-Nangal multipurpose river valley project was undertaken. The intervening decades were marked by various excuses and a 4-year injunction on the Punjab Government obtained by Sind on the recommendation of the Indus Commission of 1941. The ban expired on October 1, 1945.

The state is without coal and petroleum fields. The remedy lies, therefore, in the development of hydro-electricity which will in turn facilitate agricultural production, through electrically operated tube-wells to make the country self-sufficient. Fortunately for East Punjab there are great possibilities for such water-power development at Bhakra and Nangal on the Sutlej river. The essential feature of the Bhakra project is the construction of a cement and concrete dam, 689 ft. high, across the River Sutlej at the site of Bhakra Gorge, about 50 miles upstream of the present headworks of the Sirhind canal in East Punjab. The total storage capacity of the reservoir is estimated to be 7·2m cubic ft. of which nearly 5·5m cubic ft. will be available for hydro-electric power generation and irrigation purposes every year. According to the latest design the reservoir level has been kept at 1,680 ft. above sea level. The dam would have an overall height of about 680 ft. and would rank as the highest straight gravity dam in the world.

Stored waters would provide irrigation facilities for nearly 6·6m acres of land and generate about 230,000 kilowatts of electric energy. An additional 170,000 kilowatts would be produced on the Nangal hydro-electric canal which forms a feeder channel for the Bhakra canal system.

The length of the dam at the top will be about 1,700 ft. and the width of the base at its widest point about 1,100 ft. A 30 ft. roadway will be provided at the top.

During construction of the dam the river will be diverted through two 50 ft.-diameter diversion tunnels, one on the right and the other on the left, going through hillsides. Each tunnel will be about a half-mile long.

The Nangal scheme provides for an auxiliary dam or barrage across the river at Nangal, about eight miles downstream from Bhakra, which will divert the river into the Nangal hydro-electric canal and at the same time serve as a balancing reservoir for taking up daily fluctuations from the Bhakra dam and for meeting daily and weekly load variations on power

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Government had no further pretext to put off the scheme especially as the entire winter discharge of the five rivers had been utilised to the advantage, largely, of what is now West Punjab. Admittedly further irrigational development lay in the storage of the surplus monsoon water.

houses on the Nangal hydro-electric canal. The Nangal dam will be a massive concrete weir 1,029 ft. long, 400 ft. wide and with its deepest foundation going down to 50 ft. below the river bed. The waterway will consist of 28 bays 30 ft. wide, each provided with a steel gate which will head up the water about 50 ft. above the existing river bed. The Nangal Hydel System will supply electric power to Rupar, Ambala, Karnal, Panipat, Hissar, Bhiwani, Rohtak, Nabha, Patiala, Ferozepur, Faridkot, Kalka, Kassauli, Simla, Jullundhar, Hoshiarpur, Kapurthala, Dhilwan and 49 other small cities. When Bhakra is completed, electric power will be extended to Delhi, Gurgaon, Palwal and Rewari.

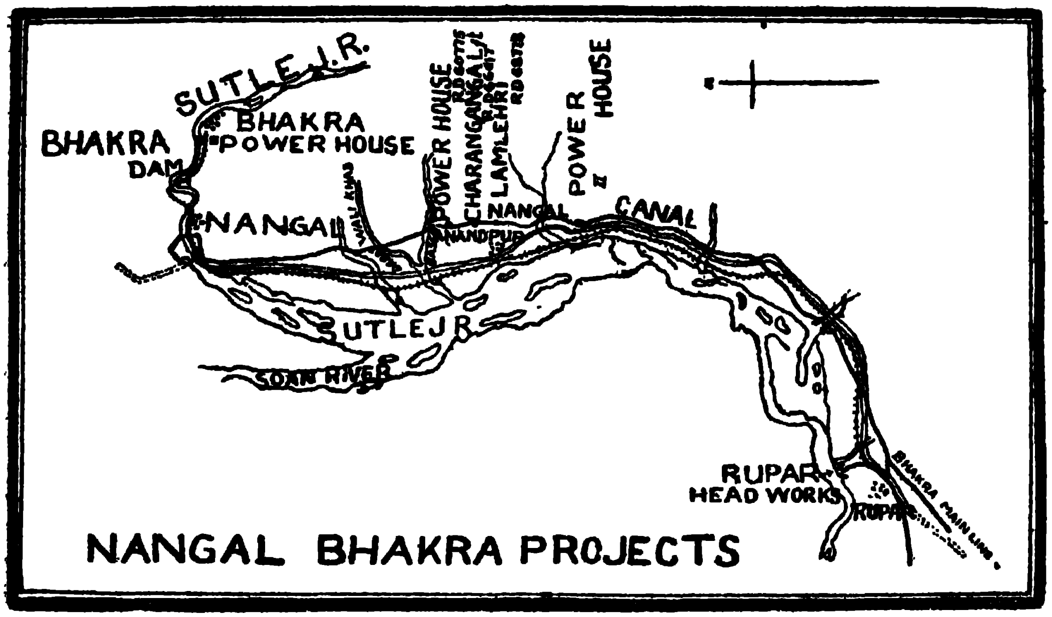

FIG. No. 124.

The hydel power will also be used extensively for tubewell irrigation in several areas of East Punjab which are not served by canals. "Tube-wells will also serve to de-water the water-logged areas and supply this water elsewhere in dry areas." In cousre of time power will be used for railway electrification, especially on the main line between Delhi and Amritsar.

After its start in 1951 the concreting of the Bhakra dam is expected to continue over a period of about 53 months. The entire work including installations of pen-stocks and outlets, trashracks, drum-gates and power units in the left power house is scheduled to be completed by March,

1955. This programme is based on the assumption that most of the plant and machinery will be received in time and supplies of essential materials like cement, steel, coal, fuel, oil and petrol will be available as required.

The Rihand Valley Project is by far the most important multi-purpose scheme in Uttar Pradesh. The dam at Pipri, on the river Rihand which is a tributary of the Sone will be the largest reservoir in India. The dam will be over 3000 feet long, and the storage capacity of the reservoir will be 90 lakh acre feet. The surface area of the lake created will be 180 square miles.

The scheme will confer numerous benefits on the country. (*a*) The eastern parts of the State do not have any proper irrigation system and entirely depend upon rainfall for crops. The scheme shall enable the construction of 3000 tube-wells and 4000 miles of pumped canals from the Gogra, Ganga and Jamuna rivers. Thus, large tracts of unbroken land will be cultivated for food production ; (*b*) fish culture will be possible in the huge lake ; (*c*) the canals will bring the unexplored region of the Sone valley in touch with the Ganges. Large cargo vessels will ply between the Hooghly and the Rihand ; (*d*) the industrialisation will take place in the wake of the Project. The region is one of the richest in mineral wealth ; (*c*) some sections of the Northern Rly. can be electrified to save coal. The power raised from the water will result in the saving of 20,000 wagons of coal per year.

Other benefits of the scheme will be control of flood in the Rihand and the Sone, lesser soil erosion in the Rihand valley, better afforestation in Rewa and restoration of marginal lands. Thus it is an ambitious undertaking designed to pave the way for the agricultural and industrial advancement of the eastern parts of the State and is destined to become a landmark in the development of India.

FORESTS AND THEIR PRODUCTS

India is very rich in forests which cover more than ⅙ of the total area of the country. Throughout this vast forest-area there is a variety in the types of forest vegetation, depending on variations of climate and soil and on the other local factors.

The Indian Union possesses about 155,000 square miles of forests or 25 per cent. of the total land area. About 12 p.c. of the total area may be classified as merchantable forest.

Geographical Distribution of Forest Areas*

State	Forest area in square miles (1948-49)
Assam	20,929
Bihar	2,473
Bombay	15,347
Madhya Pradesh	19,414
Madras	17,504
Orissa	2,874
Punjab	4,873
Uttar Pradesh	10,743
West Bengal	2,680
Hyderabad	9,455
Kashmir	11,058
Mysore	4,448
Pepsu	332
Rajasthan	12,782
Saurastra	631
Travancore-Cochin	3,065
Total 'C' States	19,303
Andaman	2,189
	160,104

Broadly speaking, there are five types of forests in the Indian Union.

(1) Arid country forests, extending over a considerable portion of Rajputana and the south of the Punjab. The most important tree is the babul.

(2) Deciduous forests extend over large areas in the sub-Himalayan tract, and in the Peninsular India. Sal, teak and a great variety of other valuable trees are found in these areas.

(3) Evergreen forests occur in those areas where the rainfall is heavy. Such regions are the west coast of the Peninsula, and the Eastern sub-Himalayan tract. The trees are bamboo, palm, fern and Indian rubber.

(4) Hill forests. They vary according to elevation and rainfall. In the Eastern Himalayas and Assam the forests are full of oak and magnolia. In Assam pine trees grow abundantly at an elevation of 3,000 to 6,000 ft. Deodar, pine and oak occur in the North-Western Himalayas.

Source : *Statesman Year Book* 1952, page 155.

(5) Littoral forests occur on the sea coasts and along tidal creeks. The most characteristic trees belong to the mangrove family.

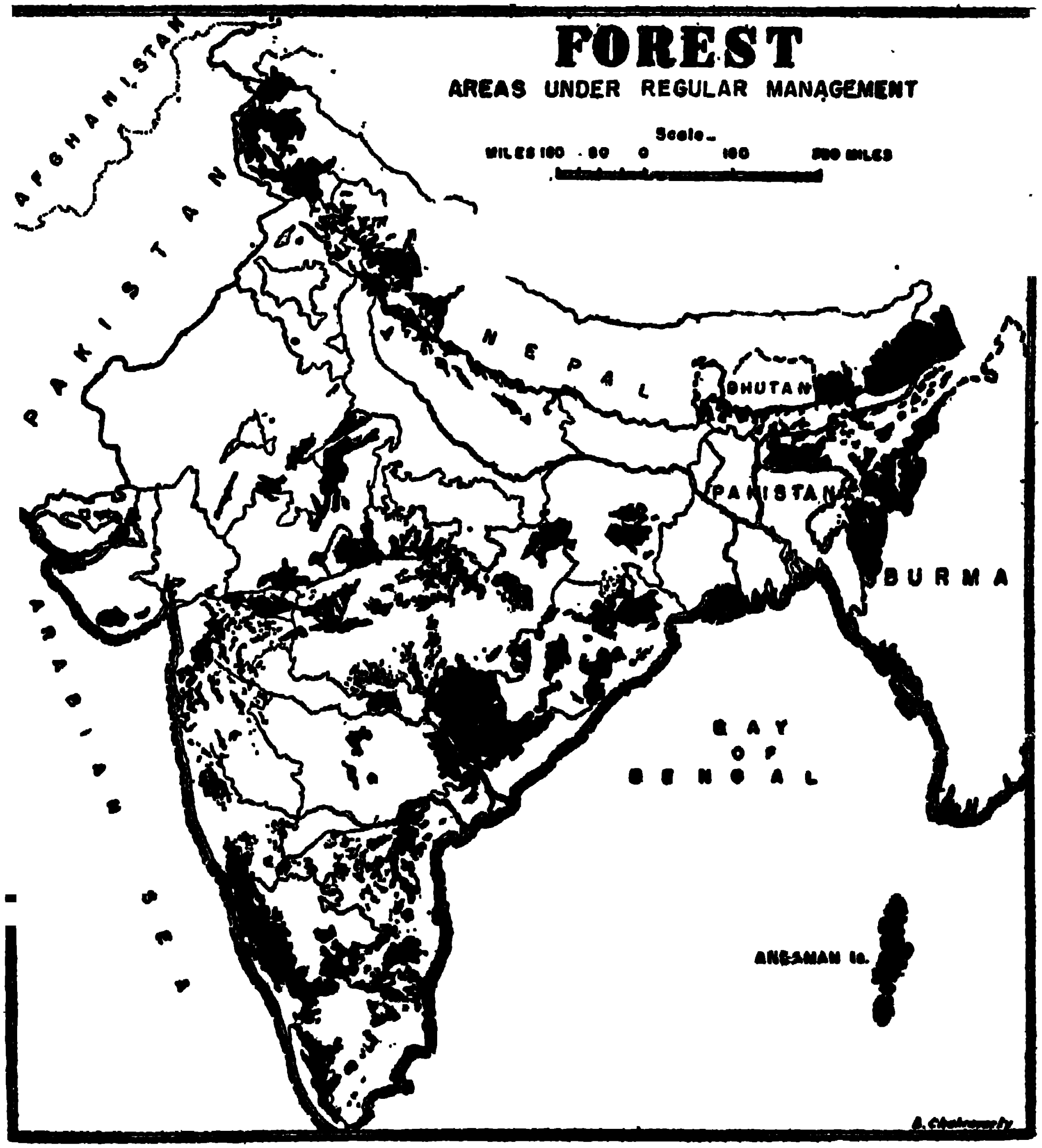

FIG. No. 125. There is no proper balance between agricultural and forest lands in India. While Coorg, Madras and Madhya Pradesh have sufficient forest areas, most of the other areas have much less than the minimum required for proper land use.

Indian forests provide employment to a large number of people such as wood-cutters, sawyers, carters, carriers and raftsmen.

Indian forests play an important part as suppliers of raw-materials for various industries. The forest produce is divided into two main heads: (1) major produce, *i.e.*, timber and firewood and (2) minor produce, *i.e.*, comprising all other products such as lac, tanning materials, essential oils, turpentine and resin. Paper industry is dependent on bamboos for the manufacture of paper pulp. Match-making industry also depends on the forest produce.

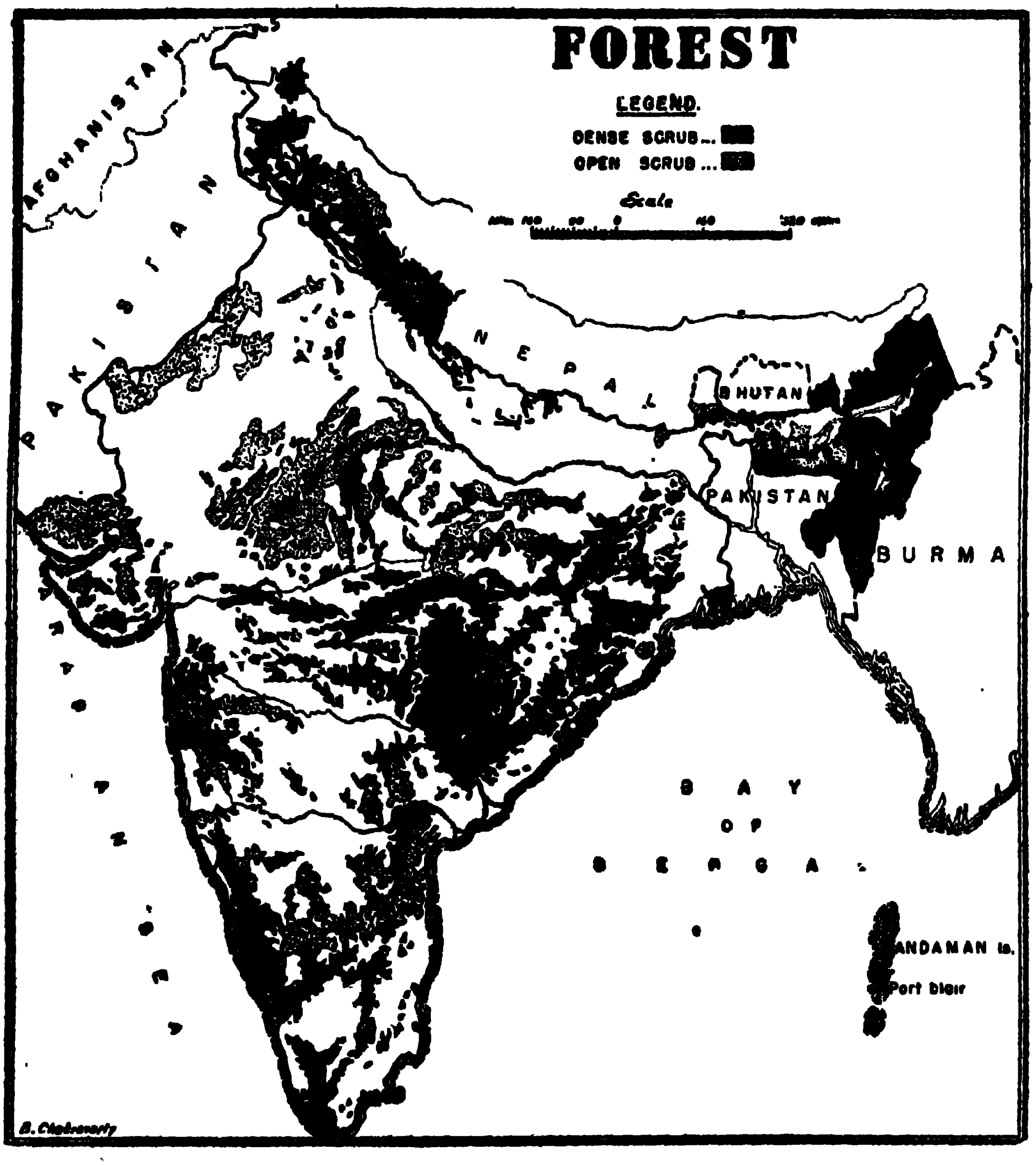

FIG. No. 126. The area under dense scrub covers about 80 million acres in India.

Forests are replaceable, but at a slow rate. So the use of forests as a source of fuel is not desirable. Forests should be reserved for other and more profitable purposes. "Wood should be altogether left out as a source of power supply, whether as an alternative or as a supplement to coal or electrical energy."

The annual production of timber in India is 260 million cubic feet. Important timbers include deodar, sal, rose-wood, padauk, Indian mahogany and teak.

India exports firewood, hardwood, sandal wood and teak to Hongkong, U.S.A. and other countries. In 1951-52 she exported hardwood including timber to the extent of 2,277 cubic tons.

Lac is secreted by a type of insects which feed on the saps of certain trees. These trees are palas, peepul and kosum, and are found in the south eastern districts of Bihar, the western border areas of West Bengal, and adjoining districts of Bihar, Uttar Pradesh, Vindya Pradesh, Madhya Pradesh, Orissa and Assam. Chotanagpur in Bihar raises 60 p.c. of India's total. Only 2 p.c. of the production is consumed in India, and the rest is sent outside.

THE CONSUMPTION OF LAC

Gramophone Record	35 p.c.
Polish and Varnish	20 ,,
Electrical Insulation	15 ,,
Hat Stiffening	10 ,,
Ceiling Wax	5 ,,
Lithographic Ink and others	15 ,,

India enjoys a practical monopoly of the lac trade. Best customers of the Indian lac are the U.S.A. and the U.K. About 98 p.c. of the total lac export is handled in Calcutta. In 1951-52, the Indian Republic exported 717,000 cwt. of lac.

Resin is derived from the pines of the Himalayas and Assam hills and is worked for making resin and turpentine oil. Resin is used for shellac adulteration, in paper mills, soap factories, etc., while turpentine has demand for medicine and varnish.

Myrobalans grow in abundance in Madras, Bombay, West Bengal, Chotanagpur, Orissa and other places. A variety is found in Coimbatore whose fruits are very small in size, but the tree is taller than the *peepul* tree of our country. The fruits, the bark, the leaves, the trunk—every part of the myrobalans has some use or other for us. The timber is very strong. The Jubbalpore myrobalan is the best of all and is used for the preparation of medicine and dyes. *Myrobalan is a great toner in tanning*. The alkali of myrobalans is useful for preparing different dyes by mixing with various ingredients. In Madras myrobalans are extensively used for dyeing cotton, wool and skin. In Assam, *endi* and *Muga* silk are dyed with myrobalan alkali. During 1951-52 India exported 834,000 cwt. of myrobalans, half of which was handled by Madras followed by Bombay with 25 p.c. England, Germany, Belgium, China, Japan, the U.S.A. and Australia are the chief importers of Indian myrobalans.

In recent years, the forest products have assumed great importance as raw materials for medicinal and perfumery purposes. Sandal wood oil, palmorosa (from Rosha grass), linalol, and vetivert are important essential oils. Margosa (Neem) oil is regarded in India as a specific for skin diseases and is used in soaps. Drug-plants are also exploited in India and these include Atropa, Belladona, Hyoscyamus, Podophyllumemodi, Nux Vomica, and Artemisia Previfolia. Other drugs include Aconite, Mentha, Juniper, etc.

The Forest Research Institute at Dehra 'Dun is engaged in (*a*) finding out suitable woods for aircraft construction, (*b*) producing cheap printing paper, (*c*) discovering indigenous woods suitable for use as battery separators, etc.

The question of *bringing timber and other materials from forests to the road, railway or river that leads to the place of utilisation,* is the main problem of the forest industry. At present two methods are applied : (*i*) employment of bullocks, buffaloes and elephants as carriers of forest produce, and (*ii*) timber rafts are floated down the rivers during monsoon months to be dragged again from the water (after, of course, many days of floating) at the saw mills.

Some important commercial timbers

BAING (*Tetrameles mudiflora*) from Assam is a white soft wood.

BENTEAK from the West coast is a reddish brown moderately hardwood and has considerable demand for furniture, coffee cases, ship-building, etc.

BIJASAL obtainable in Bombay, Madras and Bihar is a very hard, close-grained durable wood and is used for door and window frames, furniture and agricultural implements.

BLUE PINE (*Pinas excelsa*) from the East Punjab is much used in constructional work.

DEODAR (*Cedrus Deodara*) is a moderately hard wood, strongly scented and oily and is used for railway sleepers and in building.

DHUPA found along the foot of the Western Ghats, besides giving the gum resin, is used for tea chests and packing cases.

HALDU (*Adina cardifolia*) is found all over India. It is a yellow, moderately hard, even-grained wood and is used for furniture and cigar-box-making.

INDIAN ROSE WOOD is world famous and is found mostly in the forests of the southern part of the Western Ghats. It is also available in M.P. and Orissa. Extremely hard and close-grained, this dark purple wood is the highest priced timber in India and is widely used for furniture making.

SHISHAM otherwise known as *Sisso* is available in Uttar Pradesh, East Punjab and West Bengal. This wood is very hard, close-grained and brown in colour and takes a high polish. It is much used for carriage, cart and boat-building all over the Northern India.

IRUL WOOD and MESUA (*Mesua ferra*) are found in Madras. Being very durable, they make excellent railway sleepers. Mesua is also available in Assam.

SAL (*Shoera robusta*) is in regular demand in Northern India for building piles, beams, planking, door and window posts and for railway sleepers. This timber is available in Assam, West Bengal, Bihar, Madhya Pradesh, Orissa and the Uttar Pradesh.

SANDALWOOD comes from the dry regions of South India and is a hard, close-grained, yellowish brown wood, strongly scented by the oil, characteristic of the tree. It is in demand for making boxes and small articles, often beautifully carved. The oil of the wood is also important.

SEMUL (*Bombax Malabaricum*) is found widely in Assam, Bihar and Madras. The timber is soft and white and is used for toys, packing cases and planking.

SUNDRI (*Heriteira Species*), available in West Bengal, is used for boat-building, furniture, beams, planking and posts. The wood is very tough and hard.

TEAK (*Tectonia Grandis*) is extensively found in Madhya Pradesh, Madras and Bombay. As a ship-building wood and as a good wood for house carpentry, it has long been known in many parts of the world. In India it is a general purpose timber for house and ship-building, bridges, railway sleepers, furniture, etc.

As a ship-building wood, as also for good house carpentry, teak has long been known in many parts of the world. In India it is a general purpose timber for house and ship-building, bridges, railway sleepers, furniture etc.

The timber experts believe that preserved and treated wood and pressurised bamboo could replace steel in a variety of ways. India has a wide variety of timber and a large surplus of bamboo in the forests.

This timber-for-steel scheme, if successful, may solve the steel problem which is retarding industrial development not only in India but in other Asian countries as Central and South Asia.

LIVESTOCK AND THEIR PRODUCTS

Though of poor quality, a large number of livestock is maintained in India.

NUMBER OF LIVESTOCK POPULATION IN INDIAN UNION (1950-51)

(In million)

Cattle	133·8	Horses	1·4
Buffaloes	39·5	Mules	1·1
Sheep	35·4	Camels	·6
Goats	44·1	Pigs	3·6

The world's cattle population, according to a recent estimate, comes to about 690 million animals. Cattle in *India* are estimated at 134 million. Thus India leads the world in cattle population. Cattle are used for ploughing and for milk. "Without them the fields remain unpopulated, store and bin stand empty, and food and drink lose half their savour, for in a vegetarian country what can be worse than to have no milk, butter or ghee?" The cattle in India however are ill-fed and irregularly distributed. In many parts of India, sufficient grass is not grown, and therefore, it is necessary to raise fodder crop. In Northern India due to the overwhelming importance of agriculture almost every cultivable land is occupied and thus grazing grounds are few in number. The important cattle-breeding areas are the northern Guzrat, Madhya Bharat, Nellore district, the U.P., Mysore and Bombay.

It is estimated that not less than 35 million sheep are kept in India. Sheep industry is in the hands of people who are ignorant of the trend of modern development. Sheep in India are reared particularly in the Hissar district of the Punjab ; Garhwal, Almora and Nainital in the U.P. ; Kathiawar, Guzrat, Mysore ; and the Bellary, Karnol and Coimbatore districts of Madras. The Indian sheep is inferior to that of Australia or South Africa as mutton or wool producer. The wool of Northern India is white and of fair quality while in the Peninsular India, it is grey, short and coarse. The average annual production is little above 55 million lbs. "A good deal of the wool, which comes into the Indian market is dead wool, *i.e.*, what has been removed from the carcasses of slaughtered sheep and not shorn."

PRODUCTION OF WOOL

Area	Production (million lbs.)
Jodhpur	8
Bikanir	5·7
Uttar Pradesh	5·2
Madras	4·5
East Punjab	4·3
Hyderabad	4·2
Jaipur	3·5

The wool produced in India is largely consumed for village handicraft and manufacture of coarse blankets, although a small portion is exported. The average annual export of raw wool is about 42 million lbs. A frequent complaint of the foreign consumers about Indian wool is the presence of excessive foreign matter such as sand, burrs etc. It is, therefore, desirable that wool should be properly washed and graded before export.

Goats may be considered as the poor man's cheap milk animal. Goat's milk is highly valued for human consumption, but the yield of milk from goats is very small. There are over 50 million goats in India. These animals are valued for their meat and milk and in places for their hair. Goats are very prolific and they are easily domesticated. Mules and horses are used in India mostly for drawing carts. There are 3 million such animals in India and these are found chiefly in the Punjab, U.P., and Bombay. Camels are mostly confined to the East Punjab and Western Rajputana. In these areas camels are largely used for ploughing and as draught animals.

Animal products in India are hides and skins, bone, wool, milk, butter and ghee. Hides and skins are used for making harnesses, bags, suitcases, trunks, machine belts, automobile tops and seats, cases for guns, shoes and gloves. The term hide denotes the skins of cattle, horses and camels, while the term skin is restricted to those of calves, sheep and goats. In India the hides and skins are mostly collected from the slaughter-houses. West Bengal and Madras are the largest producers of cattle hides, Madras the largest producer of buffalo hides and sheepskins, and the Uttar Pradesh the largest producer of goatskins, followed by West Bengal and Bihar. The leather centres in India are Kanpur, Agra, Calcutta, Delhi and Madras.

PRODUCTION AND EXPORT OF HIDES AND SKINS IN 1951-52

	Production	Export
Buffalo hides ...	52 lakh pieces	27,000 pieces
Cow hides ...	165 ,, ,,	195,000 ,,
Goatskins ...	297 ,, ,,	10,300 ,,
Sheepskins ...	118 ,, ,,	214,000 ,,

Indian hides and skins are purchased by the U.S.A., Germany, U.K., France, Belgium, Iraq, Iran and Burma. In 1951-52, the Republic of India exported 18,000 tons of raw hides and skins. In undivided India, the export figure was 30,000 tons. India's capacity to export hides has become limited because of the partition.

The total output of milk in India is as large as 700 million maunds. "Compared with other countries India stands second in the volume of milk production, her output being exceeded only by the U.S.A. She produces over four times the output of Great Britain, over five times that of Denmark, over six times that of Australia and over seven times that of New Zealand."*

ESTIMATED TOTAL PRODUCTION OF MILK IN THE IMPORTANT PROVINCES

	Mds. (lakhs)
Madhya Pradesh	82·5
U. P.	1101·5
Bihar	559·18
Orissa	48·89
Assam	27·8
Bombay	182·66
Madras	465·19

The two important products of milk are butter and ghee. *The production of butter from milk has increased in recent years with the development of dairy farming.* The centres of this industry are Agra, Aligarh, Bombay and Calcutta. Practically the entire production is consumed in the country.

Ghee has considerable demand in India and is "prepared by practically every household by heating butter over a slow fire until an oil is formed that rises to the surface while the refuse settles down as sediment." Ghee is used in the preparation of food and sweetmeats. Buffalo butter gives greater yield of ghee than that of cow. The ghee-producing areas are the U. P., Rajputana, Madhya Bharat and the East Punjab. The annual production of ghee in India is about 14 million maunds.

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* Report on the Development of the Cattle and Dairy Industries of India by N. Right.

The seasonal variation in the quality of ghee is always noticeable. The best ghee is produced during the winter while the ghee produced in the rainy season is of inferior quality. Cheaper and inferior fats are often mixed with ghee.

Of the total ghee production, nearly 30 per cent. is retained by the producers for domestic consumption and the rest is marketed. Ghee is also sent to the Straits Settlements, Malaya States, Ceylon, South Africa, Mauritius and Hong-Kong where a large number of Indian emigrants have settled. India also imports in normal years about 66,000 maunds of ghee, mostly from Nepal.

Recently the ghee trade has suffered greatly by the competition of vegetable oils. The establishment of ghee-grading centres is necessary for getting ghee graded and tested for purity.

Poultry. The importance of poultry in India may be judged from the fact that, domestic consumption apart, it is estimated that 60 per cent. of hen-eggs and 80 per cent. of duck-eggs are sold every year to the value of over Rs. 5 crores, the value of birds themselves being estimated at Rs. 7½ crores. The per capita consumption of eggs per annum is 296 in Canada, 154 in Great Britain and 8 in India. This is because the people in India are vegetarians. India exports dried and liquid eggs outside.

THE FISHERIES

The importance of fishing lies in the immense potentiality of that article in the food resources of this country. Notwithstanding the prevalence of vegetarianism, a large number of every caste and creed in India are accustomed to use fish in their daily diet.* Thus as a source of food, fisheries stand almost equal to agriculture and animal husbandry.

The chief sources of supply are the coastal margins of the sea, river estuaries, and backwaters for marine and estuarine fish, and rivers, canals, tanks, inundated tracts etc. for fresh water fish.

The maritime and riverine fisheries at present occupy a very minor place in the national economy of India.

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* National Planning Committee—Fisheries.

PRODUCTION OF SEA FISH IN INDIAN UNION*

Areas	Total catch (000 mds.)	P.C. of total
Kathiawar	99·8	0·99
Bombay :		
Guzrat	107·7	1·07
North Thana Zone	163·9	1·63
South Thana Zone	380·6	3·78
Ratnagiri Coast	354·3	3·52
North Canara Coast	490·9	4·90
Madras :		
West Coast—		
South Canara Coast	1604·0	15·92
Malabar Coast	2266·6	22·49
East Coast—		
Southern Section	182·4	1·81
Central Section	270 4	2·67
Northern Section	546·7	5·41
Cochin	308·4	3·06
Travancore	2423·0	24·03
Orissa Coast	303·3	3·0
Bengal Coast	577·2	5·7

Indian Union has a coast line of 2,920 miles exclusive of indentations and the total area of the sea which lies between the coast and 100 fathoms line is approximately 110,000 square miles. Only a small portion of this area is worked. The sea-fisheries are confined to the coastal waters from the shore in Guzrat, Canara, Malabar Coast, Gulf of Mannar, Madras Coast and the Coromondal Coast. All major marine fisheries are confined to comparatively shallow waters over narrow belts of continental shelves and slopes. In these areas also the good fishing grounds occupy only a fraction of the entire belts between the coastlines and the continental slopes. The greater depths beyond the 100 fathom line are almost barren from the standpoint of commercial fisheries. The unsuitability of the vessels, limitations due to climate, absence of suitable harbours and the lack of refrigeration, transport and marketing facilities are serious handicaps in the way of the development of the marine fisheries of India. Most varieties of fish caught along the coasts are edible. The principal catches are herrings, mackerel, prawns, Jew fish, cat-fish, mullets, pomfrets and Indian salmon. Mackerel accounts for over a third of the total catch and is found chiefly in the west coast of Madras, Travancore and Bombay coast. Herrings account for over 15 per cent. of the total catch. Prawns occupy the third rank with 9 per cent. Pomfrets, mullets and the Indian salmon, although very popular, are caught only in comparatively small quantities, the respective percentage being 1·7, 1·9 and 1·3. The type of fishing implements includes drift nets, cast nets, stationary nets, etc. In the sea fishermen catch fish very near the shore and do not go beyond a distance of 5 to 7 miles.

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* Report on marketing in fish in Indian Union (Government of India publication, 1951).

The Deltaic fisheries are confined to the estuaries, backwater areas, lagoons etc. and generally constitute very rich potential fisheries. While the fisheries in some areas, such as the Chilka Lake in Orissa, backwaters in Madras, Cochin and Travancore, are extensively exploited, those on the extensive deltaic area of the Sundarbans and the delta of the Mahanadi are hardly tapped. The backwaters of Travancore-Cochin covering about 300 square miles offer excellent grounds for development of estuarine fish-farming for rapid-growing species of mullets, bekti, pearl spot etc.

The estuaries of the Mahanadi and the Ganges stretching from Puri to Hooghly contain cock-up, hilsa, pomfrets, prawns, catla, cat-fish, rohu, etc., which are caught by trawl-type nets, drift nets and gilling nets, casting nets, bag nets, etc.

The river fisheries at present constitute the mainstay of inland fisheries of Indian Republic and are carried out in rivers, canals, irrigation channels, tanks, ponds, etc. The extensive expanses of the Gangetic system in the U. P., Bihar and West Bengal, the Brahmaputra in Assam, the Mahanadi in Orissa, the Narmada, the Tapti, the Godavari, the Kistna and the Cauvery systems in Madhya Bharat are the main areas. Fishing in the Ganges system is very important. In these parts, people always prefer freshwater fish. The actual yield of freshwater fisheries cannot be estimated. *The estimated marketable surplus in the country is in the neighbourhood of 4 million maunds of fish.* Nearly 95 per cent. of the available freshwater fish is marketed in the provinces and only 5 per cent. in the acceding states. Among the provinces West Bengal leads both in availability of fish as well as in value with 29 per cent. and 36 per cent. respectively. Bihar is a close second and Assam is the third in regard to the available surplus and the three provinces of West

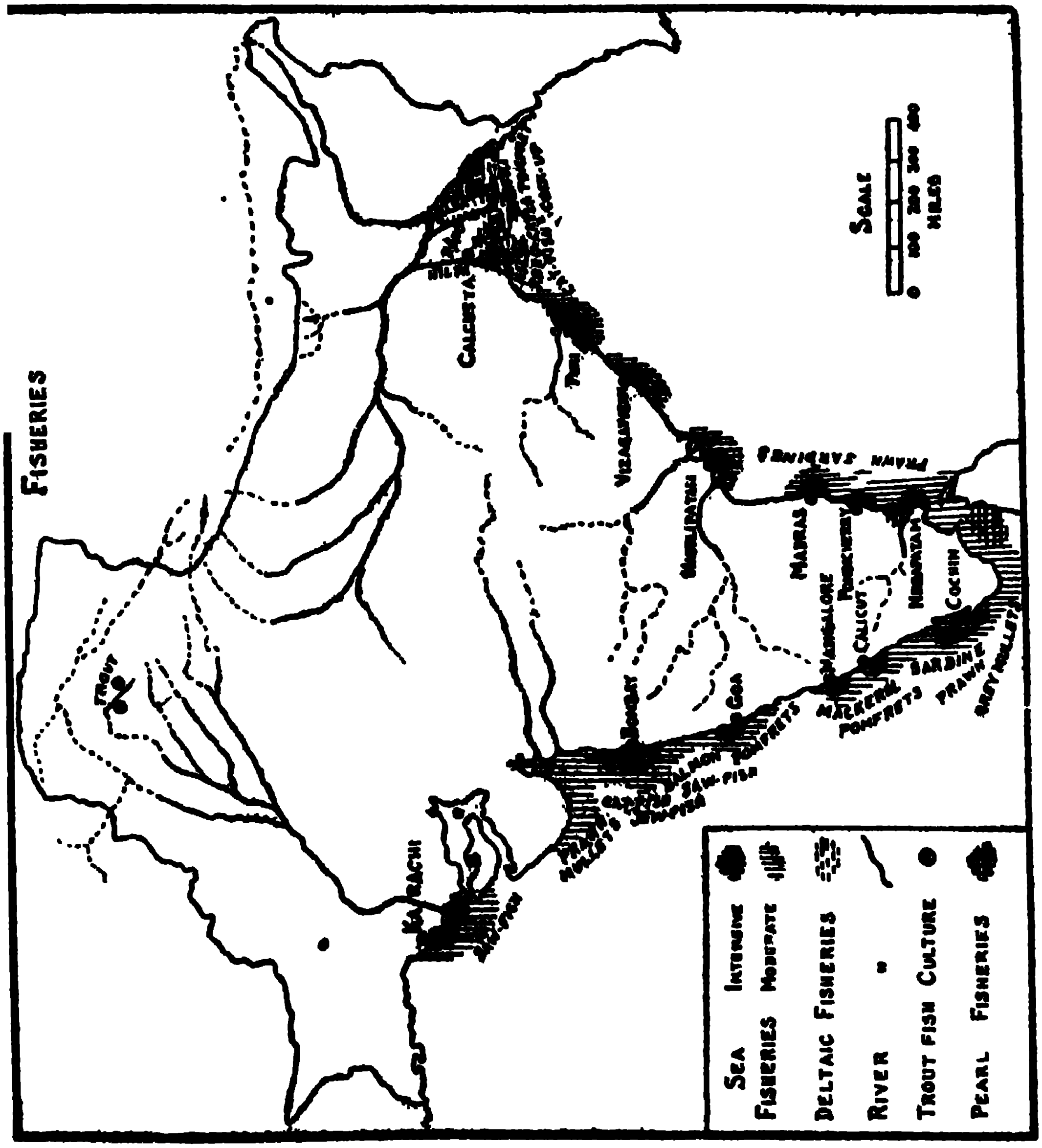

FIG. No. 127. Map showing the areas of sea and riverine fisheries of India. Note a continuous fishing belt from the Coast of Kathiawar to the Bay of Bengal.

Bengal, Bihar and Assam account for nearly 72 per cent. of the total freshwater fish marketed in the Indian Union. Madras, the leading province in the production of sea fish catches only 4·7 per cent. of the Indian total so far as freshwater fish are concerned. The Mahanadi in Orissa and the Ganges and its tributaries in U. P. yield 8·3 and 3·8 per cent. respectively of the Indian total.

The great problem that lies in the way of developing fish industry in India is that people are greatly accustomed to the consumption of certain varieties of fish and these only. Wide publicity and propaganda are necessary to enlighten the people as regards the nutritious value of fish not consumed at present.

The average *per capita* consumption of fish in India is 3 lbs. per annum, West Bengal being the leading consumer having 6 lbs. per capita consumption. In the East Punjab, it is 0·9 lbs. and in Bihar, 2 lbs.

One half of the total production is consumed as fresh fish : one-fifth is cured by salting, another one-fifth is simply sun-dried, while about 10 per cent. is converted into fish fertilizers.

Present position in Madras, Bombay and Bengal : Madras with a coastline of 1,750 miles makes a fishing ground in the shallow water area of 40,000 square miles. The fishing population is very large, but the methods are very primitive. Drifters and trawlers are never used. Country boats are engaged in catching sardine, mackerel, Jew fish, ribbon fish, etc., in the shallow waters around Ganjam, Gopalpur, Vizagaptam, Cocanada, Masulipattam, Nellore, Madras, Pondicherry and Nagapatam on the east coast and Calicut and Bangalore on the west coast. Deep-sea fisheries are practically absent in Madras.

Fish is considered an important item in food for daily use in Bengal, and many people depend on fishing industry in the Presidency Division. But fishing is confined to inland waters ; the sea fisheries are as yet little exploited. If proper attempts are made, the Bay of Bengal can yield large quantities of high-class fish. As a result of the partition, the province of West Bengal has been adversely affected in the matter of fish supply. Calcutta used to get 80 per cent. of its fish supply from places now in Pakistan. One of the easiest ways of getting fish in West Bengal is to grow fish in ponds. There are many ponds in the province. The people can grow fish, particularly Rohu and Mrigel, which can be fed in a pond like poultry in a yard. The fish are fed on boiled rice, potatoes, house-refuse and so on.

In Bombay fisheries are concerned almost entirely with the exploitation of the wealth of the sea. "Bombay is favoured with a coastline abounding with excellent harbours for fishing craft, a fair weather season lasting for some seven months, and a fishing population more alive to their opportunities and more daring than those of the sister presidencies."

Bhopal has a great scope for the development of fisheries. *Bhopal's three main rivers—the Narbada, the Baitwa, and the Parvati, with their tributaries, constitute the chief sources of fish. Also there are a large number of perennial and semi-perennial tanks, which can be utilized for raising fish.*

There is practically no fish-canning in India. The demand for canned fish is small and is met by imports. Difficulties for developing this industry are the absence of regular supplies of fish, lack of good and cheap containers and the short canning season. In India fish is preserved by desiccation with or without salt and by the use of antiseptic preservatives such as brine, vinegar, etc. The fishermen in India practise desiccation by drying fish in the sun as the process is simple and handy. During the monsoon when sun-drying is difficult, salt is used. *Canning*[*] is the best method applied for preserving sardines, mackerel and prawns and is practised on a limited scale in Madras and Bombay.

In order to develop the fishing industry in India, it is necessary to make, first of all, provision for cold storage facilities in every fishing port. Several Provincial Governments have undertaken surveys of the fishing grounds to ascertain what kinds and quantities of fish are available, and to find out how best these can be exploited.† The Government of India pro-

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[*] The fish are beheaded and thoroughly washed after which these are put in saturated brine and then dried. In the last stage, these fish are packed in cans filled with oil.

† The low socio-economic status of Indian fishermen and the lack of capital are providing India with a serious problem in attempting to enlarge and modernise the fishing industry, says Mr. H. Srinivasa Rao, Chief Research Officer of the Madras Central Marine Fisheries Research Station, in a report on Indian fishery at the first United Nations Scientific Conference on the conservation of resources (1949).

He says, "The utilisation of suitable brackish water ponds on our coasts for the culture of fish would appear to be within the collective financial resources of our fishing villages aided by our provincial and State Governments. If at least a fourth of the area of coastal salt water pools or ponds is suitably prepared and made available for fish culture, the cost would work out to half a crore of rupees. The socio-economic position of the fishermen and the lack of adequate facilities for transport and marketing, and the present financial situation in the poses to set up a chain of well-equipped pilot fishing stations along the coast of India. To begin with, stations will be located at Bombay, Cochin, Vizagapatam, Chandbali and Calcutta. Each station will have a cold storage plant with a capacity of 500 tons and refrigeratory motor vans for carrying fish to inland market by road.

The Governments of the seaboard provinces have decided to encourage the formation of co-operative societies for the marketing and distribution of fish.

Certain industrial products are also obtained from fish in India. These are fish-oil, fish-meal, fish-manure, fish-maws and shark-fins.

Commercially very valuable fishing consists of pearl fishing. There are two types of oysters which are sought after: the *window-pane* oyster whose shell is used for decorative purposes, and the true pearl oysters. Window-pane oysters are found in the open sea off the Coromondal coast, Madras coast and Cochin coast. The waters of the gulf dividing Indian Union from Ceylon and of the Arabian Sea near the edge of the Kathiawar peninsula, as well as of the Gulf of Cutch, are rich in oyster beds, yielding highly valuable pearls. Unlike the Japanese oysters which are found in shallow waters in sheltered bays, the Indian variety thrives in the deep sea and has so far failed to acclimatize itself to a shallow water existence.

Certain maritime provinces and States have built up an export trade in preserved fish to Ceylon, Burma and countries in the Far East. The export depends, to a certain extent, upon the nature of the fishing season along the south-west coast of India, a favourable season resulting in an increased exportable surplus.

Madras, Travancore and Cochin are the chief exporting areas. In 1951-52, the value of fish exported from India was

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country make it extremely unlikely that the exploitation process can be quickened appreciably in near future."

"The initial difficulties of securing trained personnel and a minimum of suitable equipment have been partially overcome. Our main aim at present is exploitation on a large scale firstly to provide the much needed food to our starving masses, and secondly to utilise the opportunities thus created for estimating our fishing resources and for studying the physical and biological environments which support our fisheries."

Rs. 3·27 crores. Ceylon is the principal buyer, the average of her share being 80 per cent., followed by Burma.

There is practically no import of raw fish into India, imports of fresh European or Canadian fish brought in cold storage in ships being negligible. But considerable quantities of preserved fish are imported. The value of imported product is only Rs. 16·3 lakhs.

MINERAL RESOURCES

Nature has been very kind to India in the endowment of mineral resources. In recent years much progress has been made in the survey of mineralised areas, and many new mining regions are being found out. In 1950 about 460,000 persons were employed daily in all the mines in India. Of these 350,000 persons were employed in coal mines.

MINING LABOUR IN INDIA (1950)

Average daily number

Coal	349,889	Petroleum*	6,776
Iron ore	17,379	Others	34,876
Copper	3,655		
Manganese ore ..	34,952		
Mica	31,010	All total	471,761

Of the various minerals found in India, the most important are coal, manganese ore, gold, mica, iron ore, and salt. She is the world's main source of supply of ilmenite, monazite and zircon and mica.

The mineral resources of Indian Union encompass a sufficient range of useful products that are required to make a country industrially self-contained. The division of India has not affected the Indian Union very much in the matter of minerals. Except for petroleum, chromite, gypsum and Fuller's Earth, Indian Union has a complete monopoly of other minerals.

With regard to non-ferrous metals like tin, lead, nickel and zinc, the country is not self-sufficient as she has to depend on other countries for about 75 per cent. of her requirements.

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* For 1949-50.

Considering the size and population of the country, the mineral wealth is not so vast as it is supposed to be. India's position with regard to supply of industrial minerals is as follows:—

(I) Minerals in which India has large exportable surplus to dominate world markets.

Iron ore
Titanium ore
Mica

(II) Minerals of which the exportable surplus forms an important factor.

Manganese ore
Bauxite
Magnesite
Refractory minerals
Natural Abrasives
Gypsum
Steatite
Silica
Monazite[*]
Beryllium
Corundum

(III) Minerals in which India may be considered self-sufficient.

Coal
Cement materials
Gold
Aluminium ore
Copper ore
Chrome ore
Building stones
Marble
Slate
Mineral pigments
Industrial clays
Sodium salts and alkalis
Limestone and Dolomite
Gypsum
Glass sand
Borax
Pyrite
Nitrates
Phosphates
Zircon
Arsenic
Barytes
Precious and semi-precious stones
Vanadium

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[*] The Government of India have entered into a 15-year agreement with two French firms for the setting up of a plant for the processing of monazite sands in India. Monazite sands, found in abundance on the Travancore coast, can be processed to yield thorium, cerium and other rare earths which India has been importing for use in various industries such as the gas-mantle industry and metallurgical operations for manufacture of special flints, aluminium base alloys, etc. Traces of uranium, used in the production of atomic energy, may also be present in Monazite sands.

(IV) Minerals in which India has to depend largely or entirely on foreign imports.

Silver
Nickel
Petroleum
Sulphur
Lead
Zinc
Tin
Mercury
Tungsten
Molybdenum
Platinum
Graphite
Asphalt
Potash
Fluorides
Antimony

The position of India with regard to Sulphur is serious. Although consumption at present does not exceed 50,000 tons a year, the indications are that with the increase in the output of chemicals and fertilizers, the requirements will go up. Unfortunately, India does not produce sulphur at all and depends on the U.S.A. and Italy. Before the partition of India, the only source of sulphur was Beluchistan (now in West Pakistan). In 1951-52 India imported 745,618 cwt. of sulphur valued at Rs. 1·16 crores.

The production of lead in the country is not sufficient for the requirements. Normally India requires about 17,000 tons of lead while the production is hardly 1,500 tons. Lead is therefore to be imported from U.S.A., Australia, Mexico and Japan.

Imports of lead in recent years are (excluding ore):

	Cwt.
1948-49	164,849
1949-50	148,109
1950-51	311,738
1951-52	154,194

The principal lead mines in India are in Udaipur and Jaipur, both in Rajasthan. Production started from 1943.

India requires nickel for engineering and chemical industries. Unfortunately, however, there is not a single nickel mine in the country nor do we find any possibility of getting this material from the country in near future. India normally imports about 1,000 tons of nickel most of which comes from Canada. In future nickel mines may be developed in Nepal where deposits are known to exist.

India consumes about 4,000 tons of tin and 12,000 tons of tinplate annually in the electrical goods industry, the metal container industry and the pharmaceutical industry. At present there is no tin mine in India and the entire requirements are met by importing tin from Malaya, Singapore and other countries.

Imports are:

	Cwt.		Cwt.
1948-49	66,566	1950-51	85,792
1949-50	71,394	1951-52	73,037

India does not produce zinc although deposits are known to exist in Rajasthan, Kashmir and Nepal. India imports zinc ore from Rhodesia, Australia, U.S.A. and Holland.

Imports of zinc:

Year	Imports (Cwts.)	Year	Imports (Cwts.)
1948-49	757,805	1950-51	748,275
1949-50	609,818	1951-52	417,830

One of the greatest defects of the Indian mining industry is that many of the minerals like manganese, mica, ebonite, chromite, refractors, etc., are worked solely for the purpose of export. And if this is continued for long, India will find herself depleted of valuable key metals and minerals.

The mineral wealth of India should be utilised for the benefit of Indian industries. Stoppage of export of key minerals and metallic ores in particular and control of the unrestricted export of raw manganese ore, chrome ore, mica, titanium ore, phosphatic materials and refractory materials in general, as well as a better adjustment of minerals, export and import tariff should be the measures in any scheme of planned economy of the nation's mineral wealth.

MINERAL PRODUCTION IN THE INDIAN REPUBLIC

	1948-49	1949-50	1950-51
Gold (ounces)	180,430	163,871	196,848
Iron ore (000 tons)	2,285	2,809	2,957
Manganese (000 tons)	526	646	902
Mica (cwt.)	151,273	151,709	N.A.[*]
Copper ore (tons)	322,282	329,304	360,308
Ilmenite (tons)	229,416	250,023	212,663
Building materials (Rs. 000)	31,628	30,031	N.A.
Coal (million tons)	31·7	32·0	34·1
Petroleum (million gallons)	65·6	N.A.	
Chromite (tons)	22,555	N.A.	
Silver (oz.)	12,797	N.A.	
Diamond (carats)	2,426	N.A.	
Graphite (tons)	1,649	N.A.	

Iron is by far the most useful of all metals. In fact modern civilization could not exist without it. One of the most significant features of the present economic organisation is that it is animated by the use of power ; without iron the extensive use of mechanical devices driven by the energy from coal, petroleum and water would be impossible. Iron has contributed enormously to the development of the modern mechanical age, but, on the other hand, the mechanical age has created the present demand for iron. Here, cause and effect are linked in a continuing process.

India is the second largest iron-ore-producing country in the Commonwealth and occupies the ninth place in the list of iron-producing countries of the world. Her resources in the high grade iron ore are perhaps the greatest in the world, with the possible exception of Brazil. The production of iron ore is at present about 3 million tons per annum.[†] In 1950, the production of iron in the Indian Union was 2,957,000 tons compared to 3,166,000 tons in 1938. The output is influenced by the demand of the iron and steel industry which is again often handicapped by shortages of coal and transport facilities.

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[*] N.A. : Not available.

[†] According to Mr. Cecil Jones, Director-General of the Geological Survey of India, iron ore reserves in Indian Union amount to 3000 million tons. The American Technical Mission which visited India in 1942 put the iron reserves of the Singhbhum district at 3000 million tons and that of Bastar State at 724 million tons. These reserves are supposed to contain 60 per cent. of iron.

The value of an iron ore deposit depends not only upon its richness in iron, but also upon its location and the ease or difficulty of mining. India is fortunate in this respect because most of her iron-ore fields are found within easy reach of coal-fields. Dolomite and limestones necessary for smelting are also found in the neighbouring areas.

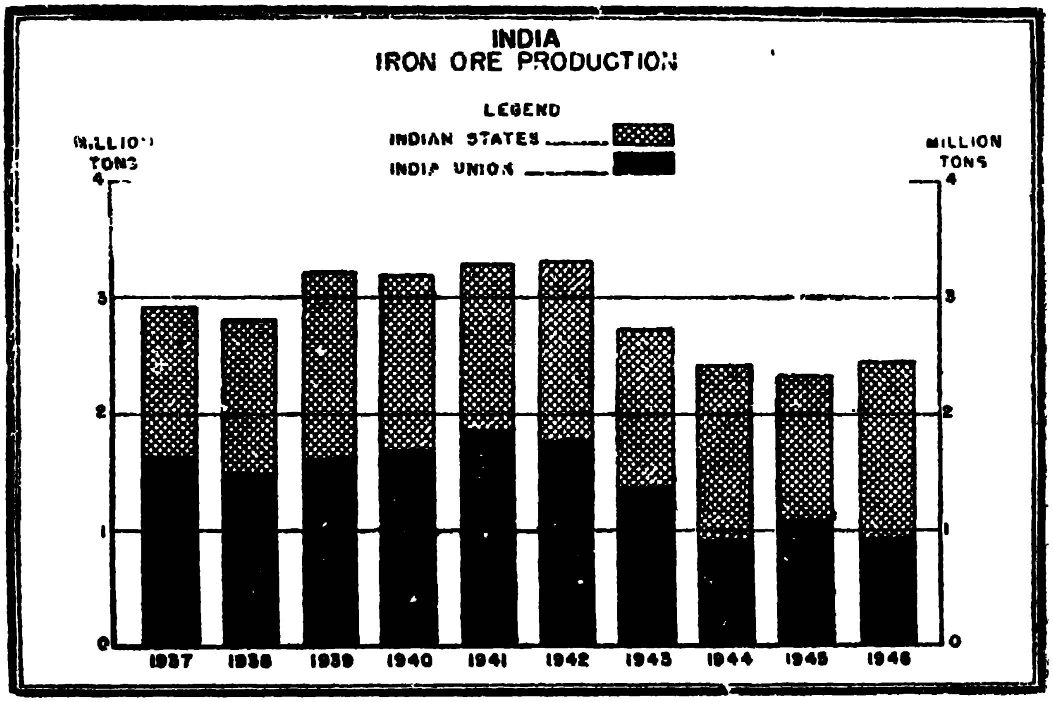

FIG. No. 128. Note the importance of States in the production of iron ore.

There are four different types of iron ores in India—magnetite, laterite, clay iron stone and haematite. The haematites are the most valuable iron ores in India, and both in quantity and quality they exceed any other ores of the same kind including the great American occurrences.

Though deposits of iron ore of good quality are found in many parts of India, the most important fields are confined to Singhbhum, Keonjhar, Bonai and Mayurbhanj of Orissa. The less important areas are in Madhya Pradesh, Madras and Mysore.

DISTRIBUTION OF IRON ORE PRODUCTION (1950)*

Regions	Quantity (tons)	Regions	Quantity (tons)
1. Orissa :		2. Madhya Pradesh	800
Keonjhar	3,00,000	3. Mysore State ..	24,000
Mayurbhanj ..	9,00,000	India's total ..	2,957,000
Singhbhum ..	12,00,000		

Mayurbhanj contains large deposits of high grade iron ore in three principal fields—Gurumahisani, Sulaipat and Badampahar. These three fields are all high lands and are connected by the branch lines of the Eastern Railway with Tatanagar, the centre of steel industry. These are also within easy reach of coal and dolomite fields and raise nearly one-third of the total Indian output. Singhbhum is the largest iron-ore-producing area in India and rich deposits of high grade haematite occur in Pansira Buru, Gua, Buda Buru and Noamundi, all in the Kalhan estate. The iron contents of the ores in this area are greater than those of Mayurbhanj State. The fields are connected by the branch lines of the Eastern Railway.

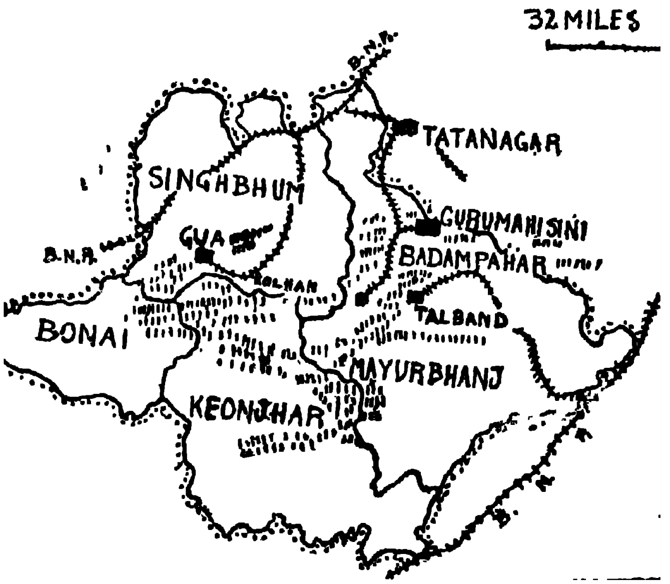

FIG. No. 129. The iron-ore fields of Orissa. Notice the B. N. Railway (now part of the Eastern Railway) serving the fields.

Keonjhar possesses two fields—one in the Bagia Buru ridge and the other on the north-eastern part which is really a continuation of the Noamundi mine of Singhbhum. Manganese and dolomite are also raised in the neighbourhood.

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* At present, iron ores are being extracted on a fairly large scale by three companies, namely, the Tata Iron and Steel Company, the Bird & Co. and the Indian Iron and Steel Company.

Madhya Pradesh is rich in iron ores, but up till now the ores have not been exploited. The total output is about 800 tons and these are mostly raised from the two fields at Lohara and Pipalgaon in the Chanda district. The Dalli and Rajhara hills in Drug district and the Bastar State hold out future possibilities.

In Mysore the main source of the ore supply is the Kemmangundi field in the Babubudan hills. Iron ores are also found in other places of Mysore but they are not worked at present. Goa and the Ratnagiri district in Bombay hold out future possibilities. Recently large deposits of iron ore have been discovered in Sandur and Salem, Trichinopoly and Kurnool districts in Madras. The quantity of ore has been estimated at 304 million tons at Salem—Trichinopoly, 3 million tons at Kurnool and 130 million tons at Sandur. These fields can be developed for the erection of a steel plant in South India.

Iron ore reserves in India are much larger than the amount of coking coal available, and therefore, India can spare large quantities for export. The principal buyers are Japan, U. S. A. and U. K.

Manganese

Manganese is used for hardening iron and steel, in the manufacture of block enamel, in the chemical industry for the manufacture of bleaching powder and in electrical and glass industries. India is the third largest Manganese producer in the world, led by the U.S.S.R. and Gold Coast. "As the demand for manganese is governed by its uses in the manufacture of steel, it is subject to great vicissitudes as the heavy industries rise and fall with the calls from trade and the manufacture of munitions."

THE CHIEF MANGANESE-PRODUCING COUNTRIES, 1947

(In 000 long tons)

U. S. S. R.	2,800	U. S. A.	124
India	393	Brazil	110
Gold Coast	589		
South Africa	284	French Morocco	102

Manganese mining in India engages nearly 10,000 workers who are mostly recruited from the adjoining districts of production. The quarrying is easily and cheaply carried out by unskilled labour.

DISTRIBUTION OF MANGANESE ORE IN INDIA

	(Long tons)		(Long tons)
Madhya Pradesh	6,46,465	Bombay	61,598
Madras	33,809	Mysore	5,323
Orissa	76.691		

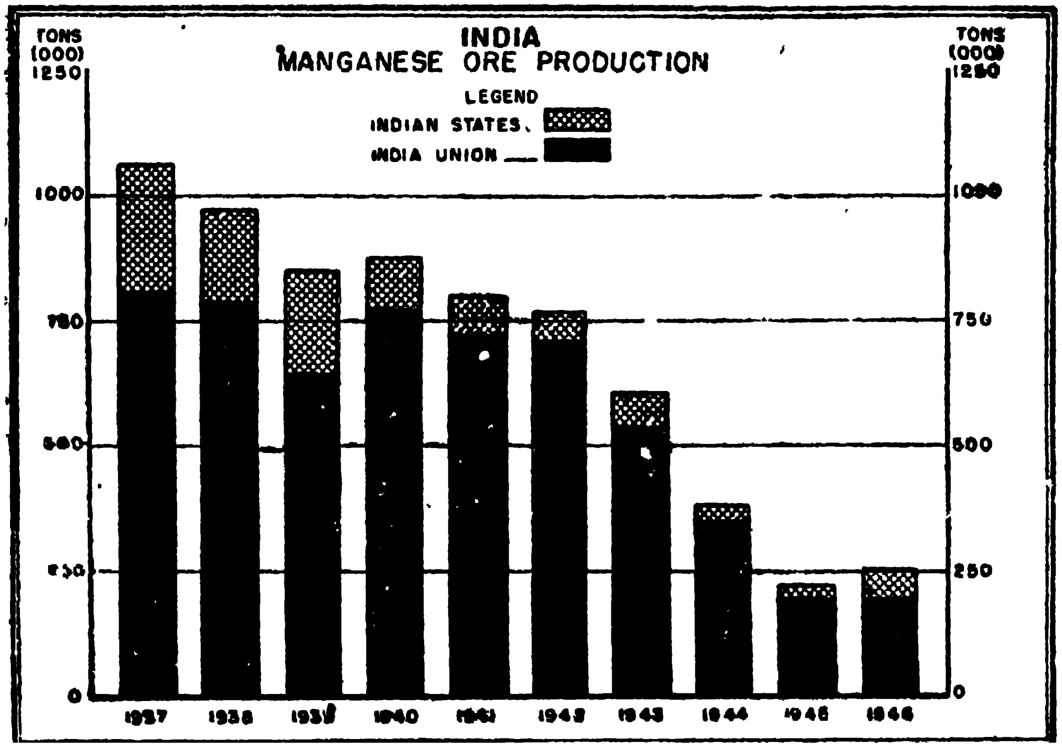

FIG. No. 130. Production is confined more to the provinces. Note the decline after 1940.

In 1950 India produced 902,000 tons of manganese ore.

The Madhya Pradesh is the largest producer of manganese ore; it is found there in the Balaghat, Bhandra, Chinduwara, Nagpur and Jubbalpore districts. The province raises nearly 60 p.c. of the total Indian output. The industry has received great impetus by the opening of the Vizagapatam port, which now permits easy movement of the mineral to the port by the Waltair-Raipur railway line. Before the opening of the port, Madhya Pradesh had to depend on Bombay or Calcutta for exporting manganese outside. Hitherto it was difficult to sell outside second grade manganese ore because of the high railway freight from M. P. to Bombay and Calcutta. Now, because of the new railway line it is possible for M. P. to meet a large portion of the world demand for second grade manganese ore.

A noticeable feature in connection with the export of manganese is the rapid stride made by Vizagapatam since the commencement of its career as a modern port.

The following figures show how the exports of manganese ore from Vizagapatam increased since 1930 and those from Calcutta and Bombay decreased.

SHARES OF PORTS IN THE MANGANESE TRADE (TONS)

		Vizagapatam	Bombay	Calcutta	Marmagoa
1930	...	4,500	2,97,738	3,00,211	1,70,577
1935	...	4,12,683	64,100	2,25,504	1,62,411
1939	...	3,37,349	55,466	2,61,575	1,28,226
1951	...	6,10,312	—	1,65,448	3,67,596

Madras produces a little more than half the output of manganese in the M. P. The producing areas are the Bellary district, Sandur State and Vizagapatam district. Much of the manganese ore is exported outside through Vizagapatam and Marmagoa.

In Bihar manganese ores are found in several parts of Chotanagpur, mainly in Kalhan and Singhbhum. A small production also comes from Chaibasa.

The Gangpur State and Keonjhar are the two important areas in Orissa for the supply of manganese. Bonai State and Ganjam also produce this ore in good quantities. In the Bombay State manganese ore occurs in the Panch Mahal district, Chota Udaipur and Ratnagiri. In Mysore, though the fields are widely distributed, the output is very small, being less than 1000 tons, and it is raised in Chitaldrug, Kadur, Shimoga and Tamkur districts. Labour is easily available in Mysore.

Although there is a steady rise in the consumption of manganese ore by the Indian iron and steel companies, the prosperity of the industry will depend on its ability to put the mineral on the world market at competitive prices. The Indian iron and steel companies consume hardly 100,000 tons a year out of the total production of more than one million ton.

The principal importers of Indian manganese ore are U. K., Belgium, France and U. S. A.

In 1951-52, India exported 1·1 million tons of manganese ore compared to 518,000 in 1938.

Just before the outbreak of the Second World War there was a sharp decline in the exports of manganese from India, owing to over-production of manganese in the producing countries, the decline in the activities of the iron and steel industry of Europe and the U. S. A. and the increased competition of Russia. Once again the demand for Indian manganese is on the increase.

Copper

Copper is usually found in combination with silver, gold, iron, lead and sulphur. It is extensively used in the electrical industries as a conducting medium as well as in telephone and telegraphic equipment, in shipbuilding, in railways and in the production of alloys. In India copper is particularly important for brass making and coinage.

India occupies the thirteenth place in the list of copper-ore-producing countries of the world. In 1940 she supplied 402,000 tons of copper out of the world's total of 2·5 million tons of contents of metallic copper. This figure compares very unfavourably with that of the U. S. A. which raises an annual average of over 330 thousand tons. Copper consumption in India too is as yet very low compared to U. S. A , U. K. and other industrial countries. The *per capita* consumption of copper in India is 4 oz. whereas in U. S. A. it is 18 lb. and in U. K. 16 lb.

In India copper used to be smelted formerly in considerable quantities in Southern India (Mysore and Madras), Rajasthan and in various other places.

At present it is mined on an extensive scale in two areas—Singhbhum and Nellore.

A copper-bearing belt persists for a distance of some 80 miles in Singhbhum where important fields like Mosabani, Ghatsila and Dhobani supply the major portion of the Indian output. The copper ores of Singbhum are related to tongues of granite which intrude the Schists. The ore occurs as veins in the granite and in the neighbouring mica Schists, quartz Schists and hirneblende Schists. The individual loads normally consist of one or more veins of sulphide varying in thickness from one inch to two feet, but the average is about five to seven inches. The average grade ore contains about two per cent. copper. The copper mines of Singhbhum employ more than 800 persons.*

The Nellore district of Madras exploits the copper ores on modern lines but the output is very small.

Copper ore also occurs in Hazaribagh, Central India and Mysore. Along the outer Himalayas, a belt of copper-bearing rocks runs through Kulu, Kangra, Nepal, Bhutan and Sikkim, which are now difficult of commercial exploitation owing to the inaccessibility of the areas and the lack of adequate communication.

Since 1938 the production of copper ore in India has been almost uniform.

COPPER ORE PRODUCTION IN INDIA

	Tons		Tons
1938	288,127	1946	352,718
1940	401,293	1948	322,382
1942	363,166	1950	360,308
1944	326,017		

India also imports copper from U. S. A., Canada, Rhodesia, Japan and Portuguese East Africa. In 1951 she imported 748,958 cwt. copper.

The prosperity of the Indian copper industry depends largely on the success of the brass-making industry. Recently, with the introduction of the aluminium products in the markets the demand for brass goods has fallen considerably in India.

Gold

Gold is mainly used for coinage and for the manufacture of jewellery. In the list of minerals in India, gold occupies the third place in value. But India's contribution to the world's total output of gold is only 2 per cent. Gold is more widely distributed throughout India than any other useful mineral with the exception of iron ore.

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* The Singhbhum copper mines are controlled by the Indian Copper Corporation Limited.

In 1950 India raised 197,000 ounces of gold.

In India gold is found in Mysore, Hyderabad, Madras, the Punjab, U. P., Bihar and Orissa. But the chief centre of gold-mining in the Indian Republic is the Kolar gold field which is situated in the Kolar district of Mysore State. This field produces about 99 per cent. of Indian gold. There are four important mines in the Kolar field. The Kolar gold-field is 40 miles from Bangalore and lies on a highland of 2,800 feet above sea-level *"where there is a single gold-bearing reef of quartz some four miles long"*. The field employs more than 23,000 workers. Sivasamudram, 92 miles distant, supplies electrical power to the Kolar field. Two of the mines of Kolar field—Champion Reef and Ooregum—are among the deepest in the world, well over 9,000 feet. The labour force on the Kolar gold-fields is of a very heterogeneous character. According to the Mysore Census Report of 1941, about 25·5 per cent. are Myso-

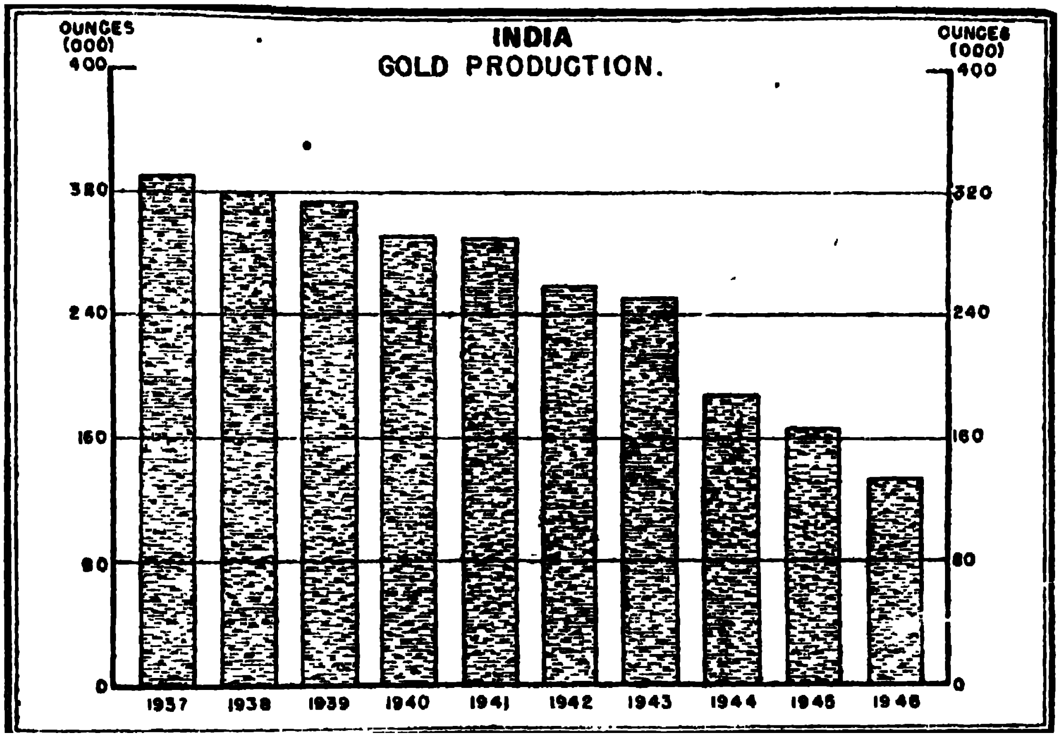

FIG. No. 131. Note the gradual decline in gold production. The maximum output was 556,527 ounces in 1905 Since then the production is on the decline. The production in 1947 was 171,781 fine ounces.

reans and the rest, outsiders from the West coast and Tamil districts bordering on Mysore State. About half the labour force belongs to the depressed classes. The quantity of gold produced at the Kolar fields from the commencement of operations in 1882 to the end of 1943 was about 20·6 million ounces.* The production of the field is, however, on the decline.

In addition to the Kolar gold field, some small production has been derived from the Bellara mine, 60 miles west of Bangalore, which has been re-opened by the Government of Mysore.

Not long ago the Raichur district in Hyderabad and the Dharwar district in Bombay produced a fairly large quantity but these fields have now practically been closed down. Shortly, production on a small scale can also be expected from the Hutti mine in Hyderabad where the equipment for the milling plant, which was delayed by the war, is now in course of erection. Though Anantapur in Madras contains several large quartz reefs, it does not at present produce any gold. Gold deposits have been found in certain parts of Salem and Chittur districts of the Madras State. Investigations of these areas will soon start.

Alluvial gold is found with sands in many rivers of India. It is recovered by the local inhabitants. Such areas are Singhbhum in Orissa ; Ambala district in the Punjab ; Bijnour district in U. P., and the Brahmaputra valley in Assam. The value of gold thus obtained does not exceed £300 a year.

India imports gold from U.K., Aden, Kuwait, Hongkong and Belgium. In 1951 the import was to the extent of about 2,000 fine ounces of gold.

Mica

India is the largest mica-producing country in the world and produces about three-quarters of the world's production.

Mica has been used in medicinal preparations and for decorative and ornamental purposes since early times in India. Today, it is one of the chief strategic minerals and is indispensable in the electrical industry. "The development of Wireless Telegraphy and Radio communication, Aeronautical Engineering and Motor Transport would have been impossible without it." Mica is also used as stove fronts, lamp chimneys, protective spectacles as well as in fire-proof points, patent roofing materials and as a decorative medium for fancy papers and ornamental tiles.

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* Report on Gold Mining Industry in India (Govt. of India) 1946.

There is at present an enormous waste in the trimming and dressing of the crude mica. About 70 to 80 per cent. of the crude mica is dumped as unmarketable refuse in the Hazaribagh and Nellore mines. This waste mica is imported by the U.S.A. where it is turned to fine powder for various uses in electrical insulation.

The industry gives employment to about 32,000 persons. The aboriginal women and children who are generally employed in mica mines carry out the work with great skill.

Although mica is widely distributed, two principal areas control its production and trade. These are (*i*) the Bihar belt, a strip of country some fourteen miles broad and over 60 miles long, running obliquely across the districts of Hazaribagh, Gaya, Monghyr and Manbhum, and (*ii*) the Nellore district of Madras.

GEOGRAPHICAL DISTRIBUTION OF MICA (1949)

Bihar :	cwt.		cwt.
Gaya	22,000	Nilgiris	43
Hazaribagh ..	80,000	Travancore	41
Monghyr	1,500	*Rajputana* :	
Manbhum	140	Ajmer ..	600
Madras :		Jaipur	400
Nellore	12,000	*All India*	152,000

Bihar may be regarded as the world's trustee for this mineral. The Bihar belt supplies more than 80 per cent. of the Indian output. Bihar mica is mainly of the ruby variety, the higher qualities of which, known as *clear and slightly stained,* are the finest in quality in the world and are greatly used in certain electrical industries. The Bihar belt is about 60 miles long and 14 miles wide and runs in a general east-west direction along Gaya, Hazaribagh and Monghyr districts.

The Nellore district of the Madras State raises mica by open quarrying at Gudur, Kavali, Atmakur and Rajpur. The fields are in the coastal plain and extend for about 60 miles. The Nellore mica has a greenish colour and is inferior to Bihar mica.

The mineral is raised mainly for export because the internal consumption of mica in India is very small.

EXPORTS

Year	Qty. in cwts.	Value Rs.
1947-48	255,259	5,65,13,742
1948-49	340,257	5,93,73,869
1949-50	297,726	6,84,58,430
1950-51	406,705	10,00,46,271

In 1951-52, the Indian Republic exported 480,000 cwt. of mica as against 161,844 in 1938-39. The principal buyers of Indian mica are the U.S.A., the United Kingdom, Western Germany and France. The U.S.A. takes about 50 per cent. of the exports.

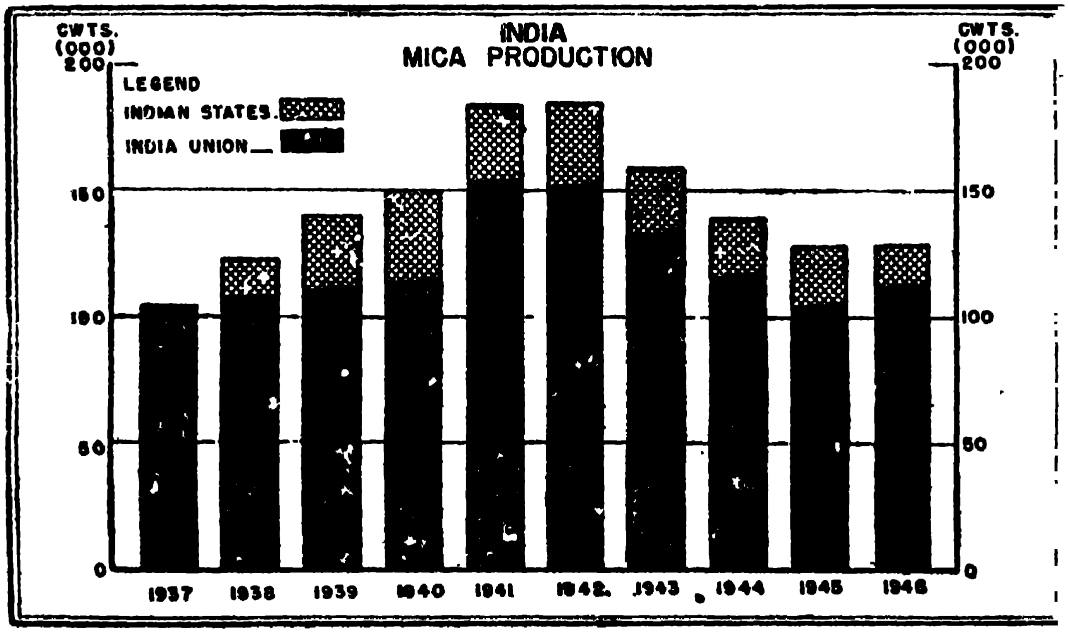

FIG. No. 132. Note the peak production in 1941-42.

The exports mainly go through Calcutta, Madras and Bombay. Calcutta alone handles 85 p.c. of export while Madras and Bombay handles 14 p.c. and 1 p.c. respectively.

SHARE OF PORTS IN MICA TRADE (IN 000 CWT.)

	Calcutta	Madras	Bombay
1950-51	280	127	14
1951-52	304	104	212

The imports of mica into U. K. from Canada and Brazil have recently affected the Indian trade. Today Brazil is not only developing as a competitor to India in international mica markets, but has also been seeking to process her mica in India. In order to protect Indian interests and prevent unfair competition against Indian mica, it is necessary to stop importation of Brazilian mica.

Moreover, synthetic mica, of which the well-known products are Pertinax, Bakelite, Paxolin and Formalite are competing with natural mica.

The future of mica industry is bright. The advance of science has not yet been able to affect the importance of mica. If the cost of miça can be kept at a reasonable level, its demand will continue to increase.

Salt

In India salt is mainly obtained from three sources—(*i*) from sea-water, (*ii*) from inland lakes and sub-soil water, (*iii*) from beds of rock salt. Indian production of salt in 1950 was about 700 lakh maunds. The chief salt-producing areas are Bombay, Madras and Rajputana. More than two-thirds of the total production come from the sea-water of the Bombay and Madras coasts. Bombay salt works include Rann of Cutch, Kathiawar and the Bombay coast from Surat to Mangalore. Dharsana and Chharvad on the east of the Gulf of Cambay and Okha in Kathiawar manufacture salt in large quantities. Normally the manufacturing season is from January to June. A considerable quantity of salt also comes from the brine of wells on the Little Rann of Cutch. The saline content of the water is very high ; and the salt is produced by solar evaporation.

In Madras, the salt-producing districts are mostly confined to the eastern coast extending from the district of Ganjam to Tuticorin in the extreme south. Salt is also manufactured in the Udipi district in Malabar. Madras contributes more than 30 per cent. of India's total production. The average production is about 130 lakh maunds of salt. About 85 per cent. of production is consumed in the province ; the balance goes to Orissa, M. P., West Bengal and Mysore.

In West Bengal a few small scale factories and cottage workers in the coastal districts produce salt from sea-water.

The workers also produce salt by the artificial lixiviation process within scheduled areas of the coastal districts. Most of Bengal's requirements are met by imports from Aden, Port Said and the Red Sea ports. West Bengal also brings salt from the west coast of India and Madras. Salt production in West Bengal can be increased by the establishment of large factories along the Sundarbans. Along the Contai sea-board of Midnapore the manufacture of salt by the method of solar evaporation is possible.

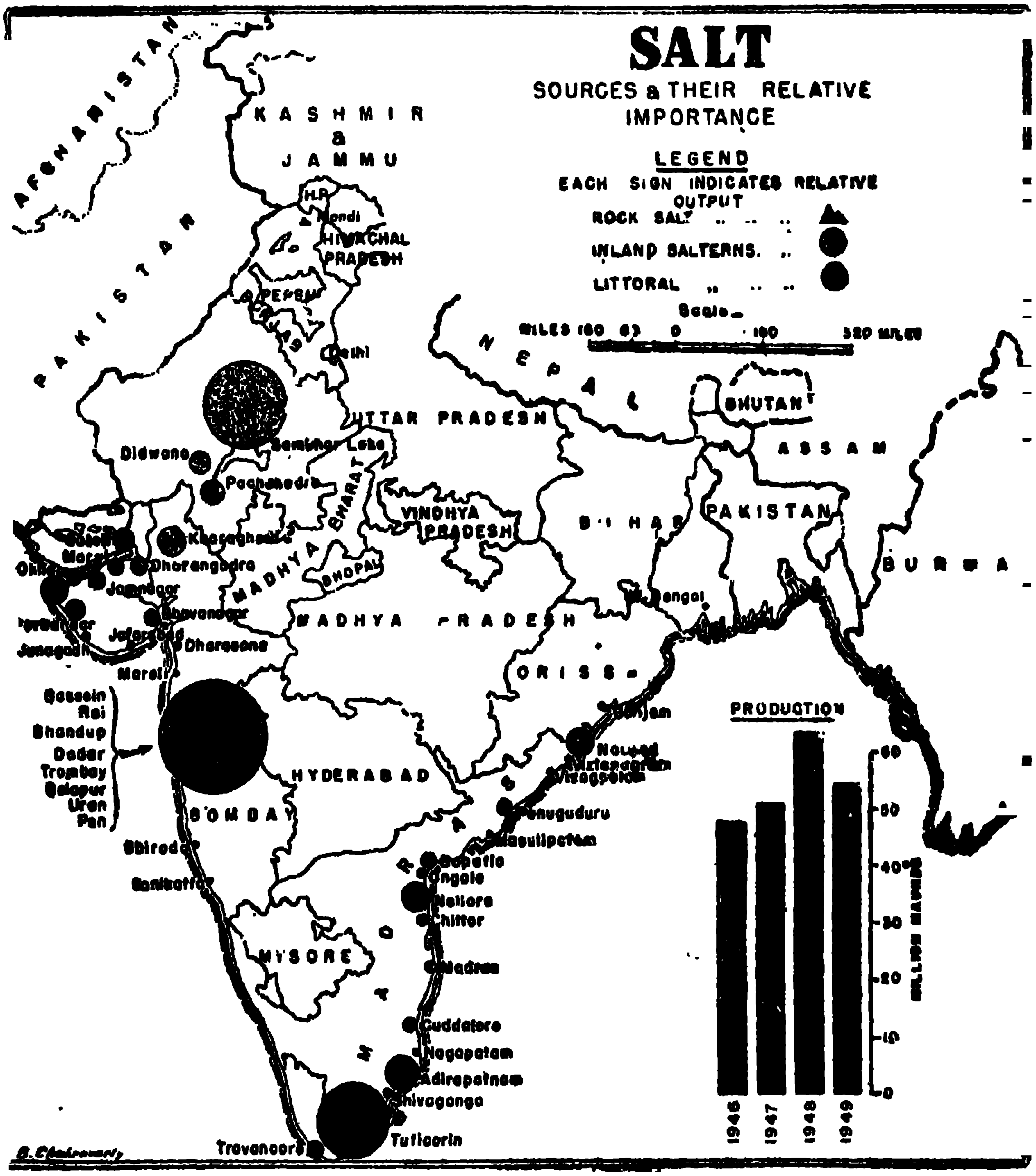

FIG. NO. 133.

Another important source of salt is the sub-soil and lake brines of Rajputana where there are many lakes. The Sambar Lake, the largest of all, covers an area of 90 square miles and produces about a quarter of a million tons every year. The reason for the high percentage of salt is that during the summer the south-western winds carry particles of salt from the Rann of Cutch and deposit them in the part, which are again washed into the lakes with rain water. The salt output in Rajputana in 1947-48 was 128 lakh maunds, comprising 100 lakh maunds from Sambar Lake. Rajputana Salt is mainly distributed to East Punjab, Delhi, U. P., Madhya Pradesh and Madhya Bharat.

SALT REQUIREMENT IN INDIA

(In million tons)

Table and other household purposes	2·07
Livestock and other agricultural uses	0·03
Fish Curing	0·01
Dairy products	0·01
Hides and Leather	0·07
Industrial uses	0·31
	2·50

Thus in India, there is very little demand for salt for industrial purposes. About four-fifths of the requirements is for household uses. In the U.S.A., however, three-fourths of the requirements is for industries. The demand for salt in India, therefore, is likely to increase a good deal with the advancement of the country and development of its industries.

Before the partition of India, rock salt used to come from the mines of the Punjab Salt Range and Kohat in the Frontier Province. In India rock salt is available only in the Mandi State in the Eastern Punjab.

The country is now almost self-sufficient in salt production. The imports of salts have already fallen to 2·5 million tons in 1951 from 10 million tons in 1948. Imports *mainly* come from Aden, Western Pakistan, United Kingdom, Egypt and East Africa and consist of white crushed salt and rock salt.

Saltpetre. Saltpetre has great industrial demand. It is used in the manufacture of glass, for food preservation and for manurial purposes in addition to its importance as a constituent of gun-powder. Bihar and the Uttar Pradesh are the important producers. The main centre of manufacture is Farrukhabad in U. P. Nearly the whole of the output is exported and a small part is retained in the country for the Assam tea-gardens. Saltpetre is exported to the U. S. A., China, the U. K., Mauritius, Ceylon and Straits Settlements.

Silver is obtained native and in combination with other metals, the chief of which are gold, lead and copper. Silver is used in India for the manufacture of ornaments, table utensils and coinage. India is by far the greatest consumer of silver in the world. In 1938, the output of Indian silver amounted to 25,000 ounces only.

Silver is obtained from the Kolar gold-field in Mysore and Manbhum in Bihar. Anantapur in Madras, once an important supplier, does not raise it any longer.

India also imports silver from U. K., Belgium and Western Germany. In 1951-52, the import was to the extent of 167,000 fine ounces.

Chromite has considerable demand in the manufacture of ferro-chrome, chromite steel and chromite bricks. This is also the source of chromium salt necessary for tanning and dyeing.

Mysore is the principal supplier of chromite and contributes nearly 65 per cent. of the Indian output. Shimoga and Hassan are the two main fields of Mysore where production is on the increase every year. The next important supplier is the Singhbhum district in Orissa which raises nearly one-third of India's total ore. The other areas where chromite occurs are Ranchi and Bhagalpur districts in Bihar.

Practically the whole output is exported outside. The principal purchasers are the U. K., Norway, Sweden, Germany and U.S.A. The shipment goes through Madras and Calcutta.

Indian chromite has its rival in the European markets in that of Rhodesia and New Caledonia.

Antimony is a useful alloy for mixing with softer metals. Although India does not at present produce antimony, the future possibilities for the development of this industry are great. A considerable quantity may also be obtained from the Chitaldrug district in Mysore. In 1948, the production was 370 tons against 235 tons in 1947.

Tungsten or *wolfram* is used in the manufacture of hard steel and in the form of wire in electric bulbs. This metal ore occurs in Singhbhum in Orissa, the Marwar district of Rajputana and in M. P., but these deposits are small in quantities. The estimated annual consumption is probably in the neighbourhood of not more than 50 tons.

Gypsum is necessary for making fertilisers and in the making of certain kinds of paper. It is also used in India in considerable quantities in the cement industry. It can also be used as a source of sulphuric acid. It is found in Rajputana, East Punjab, Kashmir, Madras and Kathiawar. The Rajputana deposits occur in Bikanir and Jodhpur.

By far the most important producer is Rajputana where the mineral is found in Bikanir, Jodhpur and Jaisalmer. Rajputana raises nearly 80 per cent. of the Indian output. In Madras the gypsum deposits occur near Trichinopoly.

The present production of gypsum from all deposits in the Indian Union amounted in 1950 to about 29,000 tons annually.

Graphite is used for the manufacture of stove-grate polishes and paints, as a lubricating agent for certain types of machinery and in making lead pencils. Up till now this mineral has not been commercially exploited although its deposits are believed to exist in Travancore, Godavari district, Vizagapatam, Orissa, C. P. and Ajmer-Marwara. In 1950 India produced 12,297 cwt. of graphite.

Asbestos is a silky, fibrous mineral found usually in veins. It is used mainly in the manufacture of fire-resisting materials. India raises a very small quantity of asbestos from the Bangalore district of Mysore, Ajmere-Marwara, in Rajputana, and Cuddapah district of Madras. India has to import every year large quantities of asbestos goods. There are, however, great prospects for an asbestos industry in India.

Diamond. Although the Indian diamond industry is the oldest in the world, its present output is insignificant. In 1935 it raised diamonds worth only about Rs. 1,00,000.

Diamond occurs in the Anantapur, Bellary, Kistna, Guntur and Godavari districts of Madras ; Sambalpur district in Orissa ; Chanda district in M. P. ; and in Bundelkhand in Madhya Bharat.

Power Supply in India

For the purpose of industrial development, a country should have cheap motive power. The principal sources of power, available in India are coal, wood fuel, oil, alcohol, wind and water.

The annual production of electricity in India is a little above 2,500 million units. "The consumption of electricity per capita in India is, therefore, a little over 7 units at the most. This is about ¼ that of Mexico, a country which the public in India considers rather backward and ⅓ that of Bulgaria which is a very backward European country. This shows that in the scale of civilisation India comes quite as low as China, or Abyssinia, as far as production of electricity is concerned."

The situation of India, with regard to the supply of coal, wood fuel or oil, for the purposes of generation of power, is not quite favourable. Coal is of inferior quality and it is most unevenly distributed. Indian forests are generally confined to hilly tracts from where transport is difficult and expensive. The production of petroleum in India is decreasing and, therefore, unless new fields are found, it cannot provide power on a large scale.

Coal. In India coal is the most important mineral product in respect of value and quantity. India is the second largest coal-producing country in the Commonwealth and occupies the eighth place in the world. The output of Indian coal in 1949 was 31·4 million tons, while in 1948, it was 29 million tons.[*]

The division of India has not affected the position of the Indian Union with regard to coal supply. India's coal industry suffers from a number of drawbacks. Indian coal is generally poor in quality: its fuel properties, that is, the percentage and condition of carbon contents, are definitely lower than those of European or American coal. With the exception of Jharia coal, Indian coals have usually high proportion of moisture.

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[*] India raised 31 million tons of coal in 1950, and the output could easily reach 40 million, if necessary. Out of these 31 million tons India raised about 8 million tons of metallurgical coke required for steel and other industries. We consume for our industrial purposes only 3 million tons of this coke a year. This surplus of 5 million tons of metallurgical coke might very well be utilised to stimulate our export trade until our industries require more coke; and in any case the use of this coke for inferior purposes such as by the Railway is wasteful particularly when there is a demand for this coke abroad.

The coalfields are again very unevenly distributed. More than 98 per cent. of the total output comes from one big belt—the Lower Gondwana coalfields (West Bengal, Bihar, Orissa, Madhya Pradesh and Hyderabad). The Peninsular India is very deficient in coal deposits and coal is totally absent in U.P. The transhipment of coal entails great difficulties in view of its bulky size. Hence it can be easily realised how expensive coal becomes as a source of motive power in industries in India, where coal must needs be carried over long distances. There is another consideration. It is not desirable to depend entirely on coal power as it is a diminishing asset and gets consumed in the process of power generation. It is necessary to conserve coal for purposes that require and must use thermal power. Coal is also one of the important raw materials for synthetic chemical industries.

The coalfields are not situated either near the coast or in the valleys of navigable rivers. In the United Kingdom, the coalfields are all found within easy reach of the sea-coast ; in Germany the fields are found along the basins of the big navigable rivers. This distance of coalfields from the sea and navigable rivers compels the Indian coal industry to look to railways for the movement of its products and consequently the freight is high.

Coal reserves in the Indian Union of different varieties up to one foot thickness of seams and within 1,000 ft. are 60,000 million tons which are mostly found in the Gondwana Basin. The total workable coal is estimated to be 20,000 million tons.

TOTAL COAL RESERVES*

		Million tons
1.	Darjeeling and Eastern Himalayas	100
2.	Giridi, Deoghar	250
3.	Ranigunj, Jharia	25,650
4.	Sone Valley	10,000
5.	Chattisgarh and Mahanadi	5,000
6.	Satpura Region	1,000
7.	Wardha Valley	18,000
		60,000

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* Power and Fuel (National Planning Committee Report), 1947.

Of these reserves good quality coal is only 5,000 million tons. The Indian coalfields committee (1946) however took a conservative view of the extent and possible duration of the nation's coal-wealth. It suggested that it would be wiser to proceed on the assumption that the reserves of good coking coal might not exceed 700 to 750 million tons. The coal reserves of the Indian Union are thus very small compared with those of U.S.A., U.S.S.R., England and Germany.

From the point of view of utilization, the Indian coal can be divided into five groups:

(1) Coal suitable for metallurgical purposes: Such coal is found in Jharia, Raniganj, Bokaro and Giridi.

(2) High grade steam coal (both high volatile and low volatile): the sources are in Raniganj, Bokaro, Karanpura, Talchar, Madhya Bharat, Madhya Pradesh and Singareni fields.

(3) Tertiary coals: Assam, Rajputana and East Punjab.

(4) Low grade steam coal.

(5) Lignites.

Geologically, the coalfields of India may be divided into two classes: (*a*) The Gondwana system of strata extending from Bengal, Bihar and Orissa to Hyderabad including Madhya Bharat and Madhya Pradesh and (*b*) the Tertiary beds found in Assam and Rajputana.

The Garo Hills in Assam contain large deposits of very high grade coal. The Central Government decided to undertake prospecting the area directly. The coal in these fields may rank among the best in the world. These fields when developed will make Assam self-sufficient in coal, thereby releasing a large quantity for export. New coalfields have been discovered in Rewa, Madhya Pradesh (Pathakera and Koba) and Bihar (Hutar). Rail projects are under survey to serve these fields. Recently the Geological Department has also discovered lignite deposits in South Arcot districts, covering an area of 16 square miles with 32 feet in thickness. This is perhaps the longest "find" in India. It has yet to be tested to what use this lignite could be put—whether for locomotives, or for extracting gas or synthetic petroleum.

REGIONAL DISTRIBUTION AND PRODUCTION OF COAL: GONDWANA BELT

Tons (1947)	*Area*	*Fields*
7,646,357	West Bengal	Raniganj.
17,318,165	Bihar	Jharia, Bokaro, Giridi, Rajmahal Hills, Palamau (Aurunga, Hutar and Daltanganj), Talchar, Rampur (partly in the Sambalpur district and partly in the Raigarh State in M.P.), Ramgarh, North and South Karanpura.
431,742	Orissa	
569,026	Madhya Bharat	Umaria, Sohagpur, Singrauli.
2,590,411	Madhya Pradesh	Mohpani, Shahpur, Pench Valley, Waroro, Yeotmal, Ballalpur (also known as Sasti field. It lies partly in Hyderabad).
1,163,077	Hyderabad	Sasti, Tendur and Singareni.
62,099	Rajasthan	Bikanir.

TERTIARY BELT

355,001	Assam	Nazira, Makum
8,627	Kashmir	

Raniganj, the earliest coalfield to be worked in India, covers an area of 600 square miles. It contributes near about one-third of the total coal production in India. The Raniganj mines are the deepest in India and seams occur up to a depth of more than 2,000 ft. The Eastern Ry. with its branch lines serves the field.

The Jharia field, 140 miles north-west of Calcutta, covers an area of 175 square miles. It is 16 miles west of Raniganj. More than 50 per cent. of the Indian output comes from Jharia. Seams occur up to a depth of two thousand feet. The Eastern Railway serves the Jharia field. The abundance, accessibility and high quality of this coal-bed have made the Jharia field the most important in India. It supplies coal used in the industrial areas of the Ganges valley from Delhi to Calcutta.

Close to the Jharia field to the west is the Bokaro field with an area of 220 square miles. The North Karanpura field is very extensive and covers an area of more than 450 square miles. Though it is not important to-day, yet in future it may become a great supplier of coal. In 1930 North and South Karanpura raised more than 2 p.c. of the Indian output. The Giridi coalfield is a small one, but it yields some of the best coal to be found in India and largely used in metallurgical industry.

In Madhya Bharat, there are two fields—one in Sohagpur in Rewa and the other in Umaria, near Katni. Sohagpur has an area of 1,200 square miles and raises nearly 1 million tons annually.

There are many coalfields in M. P. scattered throughout the Rewa-Gondwana basin, the Satpura region and Wardha valley. Two fields are very important—one in the Pench Valley in the

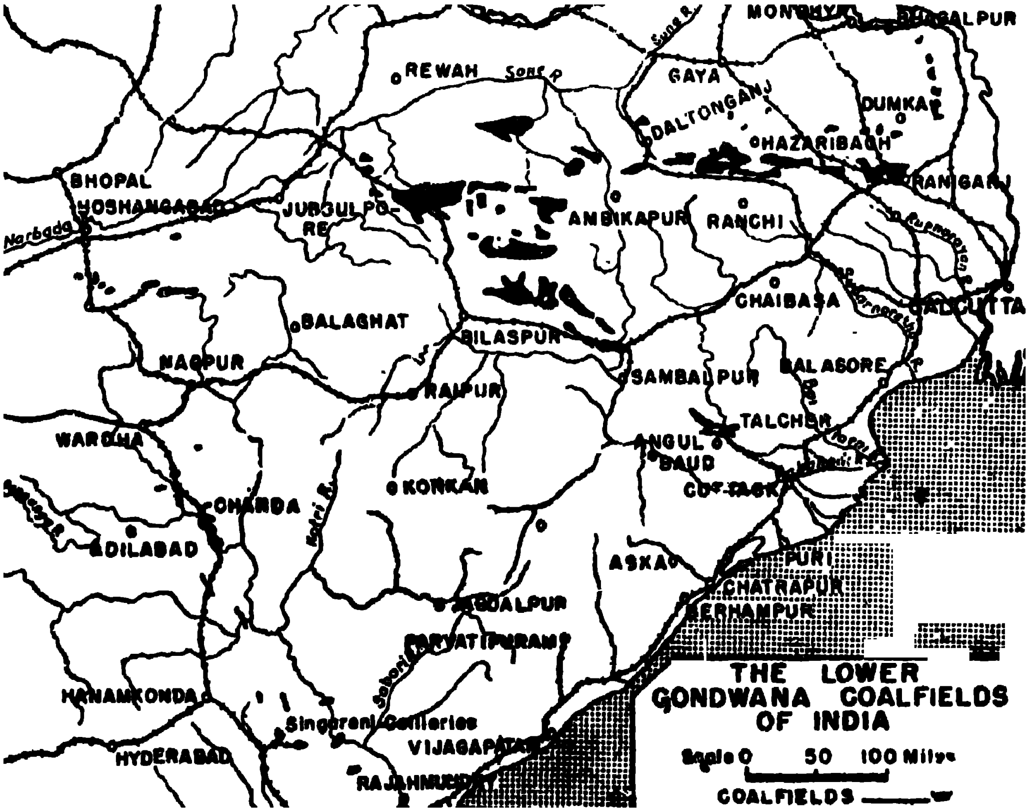

FIG. No. 134. Coalfields of Bengal, Bihar and C. P. (in parts). Notice railway lines serving these fields.

Satpura region and the other, Ballalpur, in the Wardha valley. Madhya Pradesh raises about two million tons of coal. Recently a new coalfield has been located in the Khobra area in Madhya Pradesh. The field is stated to cover about 200 square miles divided into two sections each containing about 6 million tons of first grade coal per square mile.

In Hyderabad, the principal coalfield lies in Singareni, 146 miles from Hyderabad city. "The coal itself is a dull, hard, non-coking, steam coal largely consumed by railways and mills in Southern India."

Tertiary coalfields are worked in Assam and Rajputana, and they supply nearly 2 p.c. of India's total output. Assam raises more than 50 p.c. of the tertiary coal. Makum contains coal of excellent quality which is largely consumed by the railways, steamer companies and tea-factories in Assam.

Coal is used in India for the production of electrical power, for the running of railways, for propulsion of ships, for running other industries with steam power, for smelting purposes, for such industries as glass, cement, etc. and for domestic purposes. A small quantity is used for conversion to gaseous fuel.

Railways, iron and steel and brass foundries consume more than half of the total available coal in India. Domestic consumption is as yet small although intensive propaganda is being carried on for the popularisation of soft coke as a domestic fuel.

CONSUMPTION OF COAL IN INDIA*

	p.c.		*p.c.*
Railways	31·9	Brick & Tile factories ..	3·5
Iron, steel and brass foundries	24·4	Jute mills	2·9
Cotton mills	6·7	Inland steamers .	2·4
Consumption at collieries	5·3	Tea Gardens	0·8
Bunker coal	4·5	Paper mills	0·7
		Port Trusts	0·6
		Other forms	16·2

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* Coal consumption in 1951-52 :

Consumers	Consumption in million tons per annum
1. Export & Bunkers	2
2. Railways	11
3. Public Utilities	2
4. Cement	1
5. Engineering including textile mills and light industries	5
6. Domestic requirements & Miscellaneous ...	4
7. Brickfields & Refractories	4
8. Coke Ovens	4
9. Colliery Consumption	2
Total ...	35

The demand for coal by the railways from the open market is sharply declining. This is because much of the requirements of coal of the Eastern Railway is met from their own collieries.

The coal industry of India gives employment to more than 230,000 people who are mostly recruited from Chotanagpur, Central Provinces and Bihar. Many of these labourers do not work in the mines throughout the year. In the agricultural seasons, particularly in the harvesting periods, they go back to their respective villages. This problem of periodical shortage of labour in the coalfields has been solved to a certain extent by the use of electricity in the mines for pumping and coal-cutting.

Indian labourers are not very efficient. This is reflected in the low average annual output per head of labour in the mines. In the U. K. the average output per head is 290 tons (above ground) and 300 (below ground) as compared with 130 (above ground) and 180 tons (below ground) in India. The net annual production of coal per worker declined from 141 tons in 1938 to 92 in 1948. This decline in the productivity of labour has been caused not merely by reduced hours of work, but also by the need to resort to deeper-cut mining as upper seams have become exhausted and by the use of depreciated equipment not yet adequately replaced.

The large export trade in coal once held by India has fallen greatly in recent years. Ceylon, Straits Settlements, Penang, Aden and Perim used to take considerable quantities of Indian coal. The Japanese, Australian and South African competition before the Second World War brought about a great decline in the export of Indian coal. Exports of coal from India has now increased after 1949. Pakistan and Australia are now regular customers. India exported by sea 2·3 million tons of coal and coke during 1951-52 as compared to 1·2 million tons in 1949-50. Pakistan, Japan, Australia, Ceylon, Burma and Singapore are the regular customers. Pakistan requires annually about 3·4 million tons of coal from external sources. If normal political and transportation relations are restored, Indian Union can supply the whole of Pakistan's requirements of coal.

The use of coal directly as a power is wasteful and uneconomic and can be avoided by converting coal into electricity. Besides, its conversion into electricity will permit the utilization of a number of by-products. "By electrification two-thirds of fuel consumed in industry and four-fifths consumed in colliery furnaces can be saved."

To solve the problem of shortage of labour, the Government has allowed women to work underground. The Government has further introduced a *coal control scheme* according to which all coal-owners are required to produce a certain minimum quantity and to work under conditions laid down by Government in regard to employment of labour, payment of wages, etc.

Petroleum

In terms of value, petroleum occupies the fifth place among the minerals of India. Its products are very important for the growth and expansion of many industries in India. Petroleum requires refinement before use. The manufacture of petroleum products is carried on by the distillation process. The refineries are mostly located near the oilfields and are capable of handling enormous quantities of crude oil. The products of petroleum are gasoline or petrol, fuel oil, kerosene and lubricants and these are used in steamships, railroads, manufacturing and domestic heatings. The position of India as a supplier of oil is very insignificant. In 1950, the production of crude oil was 66 million gallons.

There is one oil-bearing area in the eastern part of the Himalayan arc—Assam.

This oil-bearing belt stretches from the extreme north-east of Assam to the eastern borders of the Brahmaputra and Surma Valleys.* The Digboi field in the Lakhimpur district of Upper Assam covers an area of 2½ square miles and is the most important oil-producing field in India. The important oil centres are Digboi, Bappapung and Hansapung. An up-to-date refinery near Digboi has been established recently to distil the crude oil. The workers in the Assam oilfields are mainly drawn from Assam, West Bengal, Nepal and the U. P. The percentage of the workers from Assam is 22. In the Surma Valley some oil of poor quality is found in Badarpur, Masimpur and Patharia. In the Badarpur field, the production is on the decline.

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* The oil supplies of Assam are obtained from rocks of Miocene age, like those of Iran and Caspian region.

The oilfields of Assam are connected by railways and rivers with Calcutta through Eastern Pakistan. There is now a direct railway link between Assam and West Bengal through Indian territory. Assam Railway runs as far north as Sadya, a little north of Digboi. Digboi is connected by a branch line with Dibrugarh, and important river port. The Cachar field is practically on the main line of the Assam sector of the North Eastern Rly.

PRODUCTION OF PETROLEUM PRODUCTS IN INDIA (1948)

Motor Spirit ...	...	15 million gallons
Kerosene ...	...	4,000 tons
Diesel oils ...	...	4,000 ,,

Production is too inadequate to meet the requirements of the country. Large quantities of mineral oil are imported from Iran, Bahrein islands, Saudi Arabia, U.S.A., Sumatra and Singapore.

CONSUMPTION OF IMPORTED OIL IN THE INDIAN REPUBLIC (1951)

Motor Spirit	...	255 million gallons
Kerosene	...	254 ,, ,,
Fuel oils	...	366 ,, ,,
Lubricating oil	...	49 ,, ,,

The low production of mineral oil in India cannot be a handicap to the progress of industries dependent on oil. India has inexhaustible resources for the manufacture of synthetic fuel oils from sugar-cane and oil-seeds. The sugar factories of India throw away every year nearly a quarter million tons of molasses which could be very well utilised for the production of alcohol. When mixed with petroleum, this alcohol becomes an excellent fuel power for automobiles. In 1948 the Government of India passed an Act for the development of the power alcohol industry under the control of the Central Government and prescribed, inter alia, the admixture of power alcohol in a proportion of not more than 25 p.c. The production of power alcohol is at present at the rate of 4 million gallons a year and comes from U. P. and Bihar. The installed capacity for the production of power alcohol was 10 million gallons in 1951. In near future the production is likely to go up to 30 million gallons. It is also posssible to utilise vegetable-oil contents for the preparation of fuel oil.

There is also the scope of manufacturing synthetic oil from coal in India. The Government of India have been taking active interest in the matter and already an American firm at the request of India Government is preparing a report on its possibility.

There is room for restrained optimism about future petroleum discoveries in India. Little has been done so far to explore possibilities.

There are possibilities of oil reserves in the northern strip of "Himalayan sequence" from south of Kashmir to the north of Nepal, but the prospect of commercial success is very uncertain. Besides, the cost of exploration work itself is prohibitive. Mr. Percy Evans, noted British geologist, is of the opinion that outside Assam, India has very little prospect of any oil find in the foreseeable future. Even in Assam the disappointing results obtained in several places, after costly explorations, left little hope of new projects being undertaken. Even so, according to Mr. Evans, the area of Assam-Tipperah is the next possible oil source for India.

The Development of Hydro-electricity

Cheap power is the vital need of the country at the present moment. The total installed capacity of electrical power in India in 1946 was 1·4 million Kw. of which 494,000 Kw. was hydel power.

The aggregate water-power potential of India is very great being in the neighbourhood of 40 million Kw. The magnitude of the water-power resources will be patent from the fact that India today exploits only about one per cent. of her water-power potential.

The ratio between the total water-power developed in various countries and their estimated water-power is as follows :—

	p.c.		*p.c.*
Soviet Russia	34	Norway	53
France	32	Canada	34
Germany	54	U. S. A.	24
Switzerland	67	India	1
Sweden	27		

Possibilities are, therefore, immense in India for the development of water-power.

Indeed, India promises to be one of the leading countries in the world in the development of hydro-electric power. The great advantage of water-power is that in the process of power generation, we merely utilize the gravity of water and do not consume any substance. "If we do not put this resource to use, we are not storing or preserving, we are merely wasting it."

Water-power schemes are, generally, difficult of materialisation in India, because the power needs to be continuous, while rainfall is seasonal. Hence, costly storage works are indispensable. Favourable sites for storage works exist in many parts of the mountainous and hillly regions where the rainfall is heavy. Hydro-electric schemes have developed in Bombay, Mysore, Kashmir, Madras, U. P. and East Punjab. Western India has practically no coal ; but this is compensated for by the magnificent hydro-electric power resources in the Ghats.

In the Western Ghats of Bombay, there are three great hydro-electric power stations, developed respectively at *Lonavala, Nila Mula and the Andhra Valley.** The Lonavala works are situated at the top of the Bhor Ghats where rain water is stored up in three lakes, namely, Lonavala, Walwan and Shirawata from where it is conveyed by canals and pipe lines to Khopoli at the foot of the Ghats for generating power. The Andhra Valley Power Supply Company is situated at Bhivpuri on the Andhra river where a reservoir has been constructed by means of a dam across the river. To the south-east of Bombay on the Nila Mula river a great hydro-electric scheme was developed in 1927 at Bhira. All these three works have been developed through the enterprise of Messrs. Tata and Sons of Bombay to provide Bombay, Thana, Kalyan and Poona with electricity for light, power, traction as well as numerous domestic and industrial applications.

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* Water deposited by the monsoon rains on the Western Ghats normally finds its way to the Bay of Bengal by flowing in an eastwardly direction while dropping in its course of several hundred miles, between two and five thousand feet. The abrupt drop in the westerly direction was observed by engineers in the latter part of the last century to be a source of great potential energy provided a scheme could be devised to store and divert a portion of the water from the eastern to the western watershed and harness this energy at the time of its drop from the higher to the lower levels. The achievement of "harnessing the monsoon" gave birth to "The Tata Hydro-Eylectric System".

Southern India has developed, in recent years, hydro-electric power at various places. The total installed capacity of hydro-electric power in South India is about 230,000 Kw. although 2 million Kw. can be made available. Madras has about half of this resource and the rest is in Mysore, Travancore and Cochin. This power is in great demand in the villages of the South for lifting water from wells for irrigation purposes. There are now about 15,000 electric pumps working in South India and irrigating above 100,000 acres of land. The rural areas of the South use about 10 p.c. of the total power production in South India. The power is also extensively used in Madras, Travancore, Mysore and Cochin for industrial purposes like development of electro-chemical and fertiliser factories, textiles, machine tools, aluminium, etc. In future railway electrification of S.I.R., M. & S.M.R. and Mysore Railways will make the area free from depending on Northern India for coal to the extent of 1 million ton a year. The first Hydro-electric scheme was given effect to in India in 1920 on the Cauvery river in *Mysore* with the object of supplying power to the mining companies in the Kolar gold-fields. The power house is situated at Siva Samudram, 92 miles from the Kolar fields. At present power is transmitted not only to the Kolar gold-fields but also to Bangalore and to about 200 other towns of Mysore. In Travancore there is one hydro-electric station at Pallivasal which generates about 22,500 Kw.

There are three important hydro-electric power stations in Madras: (*a*) Pykara, (*b*) Mettur and (*c*) Papanasam. The Pykara Hydro-electric Scheme was developed in 1932 on the Pykara river in the Nilgiri district. Power is transmitted to Coimbatore, Erode, Trichinopoly, Negapatam, Madura, Virudhnagar.

The Mettur Hydro-electric Scheme is situated immediately below the Mettur Dam on the Cauvery. The Mettur Dam, one of the largest of its kind in the world, has been constructed

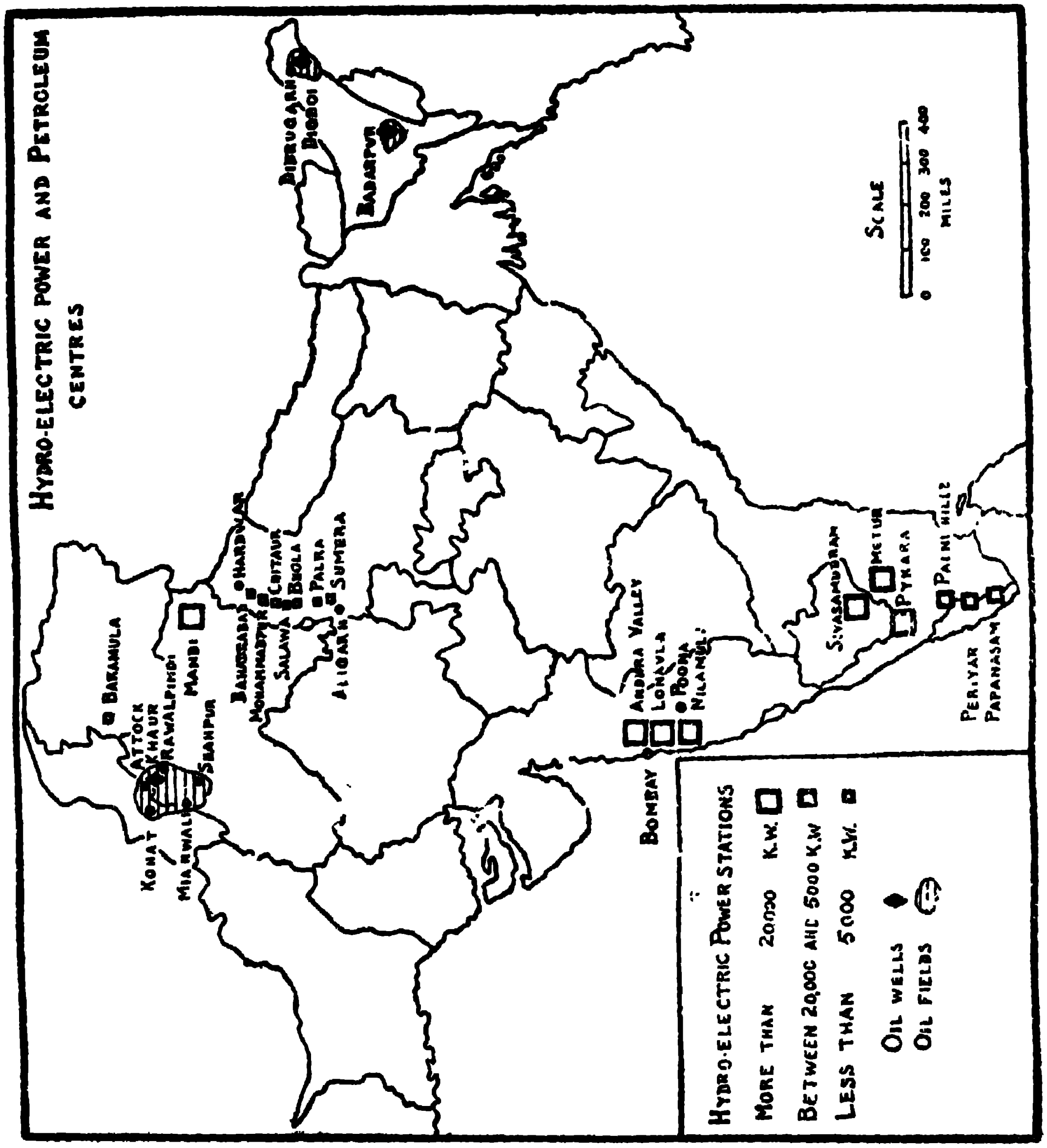

FIG. No. 135. Hydro-electric power and petroleum resources in India. Notice the great hydro-electric works in the western side of the Deccan.

mainly for irrigation, and part of the water let down for irrigation is utilised to the best advantage for the generation of hydro-electric power. The Mettur power scheme provides the districts of Salem, Trichinopoly, Tanjore, North Arcot, South

Arcot and Chittur with energy. The Mettur scheme is linked with Pykara works at Erode.

Madras has another scheme on the Tambraparni river at the foot-hills of the Western Ghats above Papanasam in the Tinnevelley district which supplies to Tinnevelley, Koilpatti, Madura, Tenkasi and Rajpalayam.

In the matter of rural electrification, Madras State is the leader. About 1450 villages receive electricity in Madras. The textile mills, cement factories, steel works, aluminium works, paper mills, Railway workshops, etc. use hydro-electric power in Madras.

A number of schemes are being worked out in Upper India, particularly in Kashmir, East Punjab and the U. P. for the manufactures of electrical energy from hydro-electric power resources. Kashmir has developed a hydro-electric scheme at Baramulla, thirty-four miles north-west of Srinagar. The power station utilizes the waters of the Jhelum river.

In East Punjab the Uhl River scheme supplies 50,000 Kw. power to the East Punjab Railway and to several industrial towns like Amritsar, and Ludhiana. The Uhl from which the power is generated is a small river in the Mandi State. The transmission system serves all big towns lying in the belt between Gurdaspur and Ferozepore as well as Simla, Ambala, Patiala and Gujranwalla. In near future the supply will be extended to Saharanpur, Meerut, Delhi and districts of Karnal, Panipat, and Rohtak. The scheme aims at providing industrial power and light to the towns of the Punjab and assisting agriculture in a number of ways by preventing water-logging and raising water to the required level on irrigated lands.

Recently in U. P. hydro-electric works have been opened in the Upper Ganges area to supply power to agriculture and industries. The Ganges Canal in its course from Hardwar to Meerut passes over 12 falls which range in height from 10 to 15 ft. The Government of the province made a scheme in 1926 to obtain energy from these falls and at present there are seven hydro-electric stations, situated as follows: Bahadurabad, Mohammadpur, Chitaura, Salawa, Bhola, Palra and Sumera. More than fourteen districts of the Upper Ganges area are served by these hydro-electric works. The Sardar

Hydro-electric project at Banbassa, Uttar Pradesh, is one of the important development projects of the State. The Scheme when completed will generate power to the extent of 700 million units.

The various multi-purpose projects which are under construction will add, when completed, about 9 million Kw. of hydro-electric energy to the country.

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PRINCIPAL MANUFACTURING INDUSTRIES

In recent years several important manufacturing industries have been established in India. The relative importance of the principal industries in India is determined generally on the basis of the number of workers employed.

INDUSTRIAL DISTRIBUTION IN INDIAN UNION IN 1947

	No. of Factories		No. of Factories
Cotton Mills	393	Chemicals	35
Jute	106	Paper	16
Sugar	142	Match	107
Iron and Steel	13	Woollen Mills	22
Cement	13	Silk Factories	90
Soap	16		
Glass	77	Total	1,030

The distribution of manufacturing industries in India is very uneven. The principal manufacturing regions are as follows :* (a) Hooghly side : about one-third of India's industrial development, with all the jute mills ; (b) The Bombay Cotton belt with Bombay, Ahmedabad and Solapur ; (c) Chotanagpur with Jamshedpur as the centre for iron and steel industry ; and (d) the Nilgiri group in Madras and Mysore for textile industries. It has been found that some industries would always concentrate in particular localities. The centralisation of industries is noticeable in cotton textiles, jute, sugar, paper, matches, woollen, silk, leather and iron and steel production.

This tendency towards centralisation is being now criticised in many quarters. There is a feeling that location of an industry should be made on the basis of the distribution of population in different provinces.

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* *Changing map of Asia* by East and Spate.

The decentralisation of industries is desirable to give as far as practicable equal opportunities for development to every province. Bombay, Delhi, Baroda, Mysore, Ajmer-Merwara and Madhya Bharat possess more mills measured in terms of demand for cloth by the people of these provinces while there is little or no development of cotton industry in areas like Assam, Orissa, Andhra and Eastern U. P. West Bengal and Uttar Pradesh should have more cotton mills because a large portion of the internal demand for cloth at present is met from outside supplies. Since the market for cloth is measured by the distribution of population, the same basis should be followed in the establishment of cotton industries in different provinces.

The iron and steel, silk, sugar industries, match factories and paper mills have considerable scope for decentralisation. On the other hand, the jute and woollen industries cannot be at present made capable of being dispersed.

The principal manufacturing industries of India are controlled both by the Indians and the Europeans. The European capitalists have invested more than Rs. 90 crores in purely manufacturing industries. The jute mills of Bengal, the tea plantations of Assam, gold and coal mining, engineering works, and woollen mills and tanneries of Kanpur are practically in the hands of the Europeans. The main cause of the supremacy of European capital is that the indigenous capital is not coming in quantity "for accelerating the progress of our material and industrial regeneration". Moreover, the country lacks in capital goods and technical personnel. In more recent years, the indigenous capital has been coming out freely, and its greatest achievements are in the lines of cotton mills industry, iron and steel industry, sugar factories, cement works and small mills. Recently many higher technical institutions with research facilities have been established in the different parts of India which will make technical man-power available within the country in increasing numbers.

In the list of the major industries the two characteristics are the predominance of the textile industries and the subordinate position of chemicals and paper.

The Cotton Textile Industry

India is now one of the leading cotton manufacturing countries of the world ; she is second in the production of cotton and third in the number of persons employed among the countries manufacturing cotton. Indeed, "the Indian Cotton textile industry is the most significant example of national achievement in the industrial sphere and is a symbol of India's potentialities as an industrial country".

The first cotton mill in India was started in Ghoosery on the Hooghly in 1822. The real progress started from 1854 when Bombay had its first cotton mill. At the end of the year 1950 there were 425 working mills giving employment to more than 5,00,000 persons in India.

At the present moment four areas lead in the production of cotton goods. These are Bombay, West Bengal, Madras and the U. P.

GEOGRAPHICAL DISTRIBUTION OF COTTON MILLS IN INDIAN UNION (1949)

Provinces	Existing Mills	Provinces	Existing Mills
Bombay	198	Gwalior	8
Madras	47	Rajasthan	10
U. P.	26	Hyderabad	6
West Bengal	40	Ajmer-Merwara	4
M. P.	8	Berar	4
East Punjab	4	Mysore	6
Delhi	4	Pondicherry	3
Indore	7	Cochin-Travancore	3

The lines of cotton manufactures consist of yarn and woven goods ; and these supply more than 80 per cent. of the country's requirement for mill-made goods. The woven goods are grey and bleached piece-goods, coloured piece-goods, hosiery, cotton goods mixed with silk or wool and miscellaneous.

Bombay has 198 mills, of which Bombay Island and Ahmedabad possess 70 mills each. Judged by the quantity and value of production, Bombay ranks first in the list of cotton-manufacturing centres. Next to Bombay city, Ahmedabad is the second largest cotton-manufacturing city in the country.

In the State of Bombay, the third centre is Sholapur followed by Poona, Surat, Broach, Hubli, Belgaum and Jalgaon.

The localisation of cotton industry in the city and Island of Bombay has been governed not so much by natural and permanent factors as by capital and credit advantages, the presence of adequate means of communication and the fact of Bombay being a port. The climatic condition of Bombay is such that it favours the production of yarn of finer counts, but the preponderance of higher counts is a feature of the Ahmedabad cotton industry and not so much of Bombay. Again, Khandesh, Berar and Wardha, where raw cotton is grown, are nearer to Ahmedabad than Bombay. When the cotton textile industry was established, Bombay had not developed hydro-electricity and depended on Bengal for coal. The cotton industry in Bombay city draws its labour force mostly from the neighbouring districts of Konkan, Satara, and Sholapur. The supply of labour also comes from the Deccan and the Uttar Pradesh.

In spite of these defects, Bombay is still the principal centre of the industry. It proves, therefore, that certain advantages are definitely on the side of Bombay: (*i*) Credit and banking facilities, (*ii*) the natural harbour. The cotton crop of the province gravitates in large quantities to Bombay for export and so a special flow of cotton for the purpose of mills need not be created. The port also enables Bombay to import machinery and other requirements from England, Germany and U.S.A. with ease.

Therefore Bombay has combined the textile specialisation of Manchester with the commercial and shipping characteristics of Liverpool.

The bulk of the cloths produced in Bombay City consists of light texture cloths made from medium count yarns. During recent years many Bombay mills have specialised on fine count cloths. Longcloth, shirting, T. cloths, domestics and sheetings account for more than 50 per cent. of the production, while the remainder consists of dhoties and coloured goods.

The first cotton mill at Ahmedabad was started in 1859. The industry has made tremendous progress since 1929. In 1944, the city had 70 mills and employed about 130,000 workers.

The principal sources of labour supply are Ahmedabad district, Baroda and Gujarat. About 60 per cent. of labour comes from these places. Rajasthan supplies about 12 per cent. of labour force. Ahmedabad is capable of producing almost any grey, bleached, woven coloured or printed cotton fabric in general demand. Her annual production exceeds 1,000 million yards of piece-goods. Ahmedabad also produces dhoties and saries on an extensive scale.

The Cotton Mill Industry in West Bengal has made exceptional progress in the last ten years. At present production is mostly confined to grey and bleached goods with dhoties for home consumption predominating. There are now 40 cotton mills in West Bengal and a few more mills are in the course of erection. The industry is located in three districts, namely, 24-Parganas, Howrah and Hooghly—all along the Hooghly basin, within a radius of 32 miles from Calcutta. The Hooghly basin offers unique opportunities for the development of industries inasmuch as the area is served by a perfect network of railways and riverways. Calcutta, by bringing mill machinery and raw cotton from abroad, distributes them to the different cotton centres of the Hooghly basin. The economic advantages of Calcutta in being near to Jharia and Raniganj coal-fields, besides being itself a money and labour market, have influenced greatly the concentration of cotton textiles around the city. The mill centres are Sodepur, Serampore, Panihati, Shamnagar, Maurigram, Belghurriah, Palta, Fuleshwar, Salkia and Ghoosery—all in the districts of Howrah and 24-Parganas.

The prospects of cotton mill industry in West Bengal are indeed very bright. West Bengal is a great market for cotton goods in India. The Bengal mills cannot satisfy the local demand to any appreciable extent. Thus the Bengal mills have before them a wide scope for expansion. Moreover, the neighbouring provinces of Assam, Bihar and Orissa will offer a vast market for the Bengal mills. As the province is intersected by many rivers, the atmosphere is very humid.

The moist climate of Bengal is no less important. Cotton industry requires moist atmospheric conditions, otherwise thread breaks. The climate of the province is certainly an advantage, if not over Bombay and Ahmedabad, at least over the up-country towns of Kanpur and Delhi, where the humid atmospheric conditions are created in the mills artificially. As regards labour, "a factor very much in favour of Bengali labour is that he is more intelligent, though physically a bit poorer, than outside labourers. But workers in the mills do not presumably require very strong physique, because the operations are such as require a sensitiveness to touch and flexibility of fingers more than physical exercise, which it does not take long time to develop."

The only problem is the question of raw materials. Bengal is situated far from the cotton-growing areas of India. But then, the high price paid for raw cotton will be compensated largely by the economy in the freight on coal.

The third largest cotton-manufacturing province is the Uttar Pradesh. Its disadvantage of being located far off from the coal-fields is compensated by the presence of a large local market, cheap and efficient labour and excellent transport facilities. The cotton industry is particularly confined to the Ganges towns. *Kanpur is the most important cotton manufacturing centre.* Although the first cotton mill at Kanpur was started as early as 1861, the real progress was noticeable from 1935 onwards. The city has now 17 cotton mills. The bulk of the labour force in the mills comes from the neighbouring agricultural areas. The cotton manufactures in the U. P. are yarn, grey and coloured piece-goods, hosiery and carpets. The U. P. produces about 230 million yards of cloth per annum, of which grey and bleached goods account for 95 per cent. of the production. Cotton carpets are becoming important of late, and the centres of manufactures are Bareilly, Aligarh, Agra, Moradabad and Etwah. Tentage and *dosuti* fabrics are made in Kanpur.

The growth of the cotton mill industry in South India during recent years has been phenomenal. South India possesses certain geographical advantages in respect of raw materials and power resources developed as a result of hydro-electric schemes. The districts of Coimbatore, Madura and Tinnevelly are important zones. The cotton mill centres are Coimbatore (31 mills), Madura (10 mills), Salem (4), Tinnevelly (4), Malabar (5), Madras, Guntur, Bellary and East Godavari. Mysore, Trivandrum and Padukota are other centres. The South Indian cotton mills concentrate mostly on spinning as about 16 p.c.

of the total spindles of India are to be found here. Only 4 per cent. of the total loomage of India is in South Indian mills.

Madhya Pradesh is an important centre of cotton manufacture in India. The plain of Berar and Nagpur lying to the west in the valleys of the Purna and Wardha rivers contains rich black soil which makes the area a great cotton-growing area. The cotton mills are located at Nagpur, Akola, Hinganghat, Rajnandgaon, Budnera, Burhanpur, Ellichpur and Pulgaon. From the point of view of labour employed, Nagpur is the most important cotton textile centre in M. P. A large proportion of the workers in the Nagpur mills belongs to what are known as the scheduled castes. There are now eight mills in M. P.

Delhi specialises in the production of coarse count cloths and produces considerable quantities of dhoties and tentage materials and excellent upholstery and tapestry fabrics.

Long-stapled cotton requirements of Indian mills are met by importation from Egypt, East Africa, Sudan, U.S.A. and Pakistan. Indian Union may import long-stapled cotton from Pakistan to the extent of 1 million bales. The Indian mills consume annually about 4·2 million bales (400 lb. each) of raw cotton.

CONSUMPTION OF RAW COTTON IN THE INDIAN MILLS:

(in bales of 400 lb. each)

Origin	1947-48	1948-49
India	2,863,450	3,123,915
Pakistan	723,216	410,956
Egyptian ...	305,697	395,850
Other foreign countries	318,519	323,915
	4,210,882	4,254,636

The development of Indian cotton mill industry has considerably affected the Lancashire cotton industry. Formerly, Lancashire had a strong hold on the market of India.

The entry of Japanese cotton piece-goods in India before the Second World War adversely affected the Indian industry, more particularly the Bombay cotton industry. *The Japanese manufactures had several advantages over their rivals in Bombay and in Lancashire.* The real strength of Japan as exporter of piece-goods rests largely on the ability of the small factories situated throughout the country to produce goods at a low cost. Many of the weavers in Japan are part-time farmers. Even the wives, mothers and elderly relatives of the farmers work in the mills. These operatives are satisfied with a very small remuneration. Organised buying of raw cotton from America and India gave Japan some additional advantage. Total freight on both raw cotton and piece-goods, from India to Japan and back, was very low. State-aid to cotton industry in Japan was also a great contributing factor for its expansion.

Indian cotton piece goods have large demand in U. K., Aden, Pakistan, Singapore and East Africa. She exported about 1,210 million yards of piece goods during 1950-51. About 90 p.c. of this trade passes through Bombay.

Cotton twists and yarns of India are exported in large quantities to Burma, Straits Settlements, Syria, Aden, Thailand, Iraq, Arabia, French Somaliland and other countries where Indian immigration is considerable. Bombay is the principal port for shipment. In 1950-51 India exported 74·4 million lbs. of cotton twist and yarn of which Hongkong took 32 million lbs., U. K. 10 million, Belgium 10 million, Aden 8 million, Singapore 5 million and Thailand 3 million.

Since 1939 the cotton textile industry of India has been passing through a period of prosperity unparalleled in its history, due to the virtual elimination of all imports.

Many new types of cloth such as khaki cellular, shirting, cotton webbing of various descriptions and jute cotton union canvas are manufactured.

PRODUCTION OF COTTON MANUFACTURES IN INDIA

	Yarn (000 lbs.)	Cloth (1000 yds.)
1948	144,76,16	431,93,03
1949	135,91,19	390,59,03
1950	117,40,00	366,50,00
1951	129,30,00	416,60,00

India can look forward confidently to a long period of post-war prosperity in the cotton textile industry, provided her industrialists exercise enough forethought and bring about a reduction in manufacturing costs, so that she can compete with her potential rivals. India has already captured the cotton markets of Iran, Arabia, Iraq, Aden, Australia, New Zealand, South Africa, etc. As these are essentially *price markets*, Indian cotton industry must try to reduce its cost of production, so that when the normal trade will be resumed, the other countries may not drive out Indian cotton goods from these markets.

Pakistan is likely to be dependent for the supply of cotton piece-goods on the Indian Union to the extent of 500 million yards.

The Jute Mill Industry

The Indian jute industry is one of the biggest industries of the country and a prominent source of foreign exchange. The Jute industry owes its development to foreign enterprise. Till 1828, the manufacture of gunny bags and cloth was in the hands of the Bengal peasant weavers and the production was very small. But after 1832 when it was found that jute might be used as a substitute for hemp as a result of the experiment carried out by a Dundee merchant, the demand for jute increased. In course of time, the bleaching and dyeing processes improved and jute finally gained rapid popular favour. Thus the foundation of the jute-manufacturing industry was laid in Calcutta and Dundee.

After cotton, jute is the most important industry in India. "In point of efficient organisation, the jute industry is perhaps second to none in India." The industry employs a daily average of nearly 3,00,000 workers. In 1940, the Indian Union had 68,416 looms which worked out to be 57 per cent. of the world's total. Germany and Great Britain came next with 8 per cent. and 7 per cent. respectively.*

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* Indian Central Jute Committee Report on the marketing of Jute and Jute products, 1940.

Calcutta has the leadership in jute mill industry. Practically all the mills are in the neighbourhood of Calcutta on the banks of the Hooghly.

States	Mills	States	Mills
Bihar and Orissa	3	Uttar Pradesh	3
Madras	4	West Bengal	95

There are certain geographical factors for this localisation of jute industry along the Hooghly basin within a radius of 20 miles of Calcutta. Since the Jute mill industry aims at exporting its manufactures abroad, the question of accessibility to the port is of main consideration. The location of the jute mills along the Hooghly basin is such that the mills can bring raw materials with ease from the interior and can export its products readily through the port of Calcutta. Had jute mill industry been mainly intended for home market, its location would have been near the sources of raw materials. Regular steamers and boat services connect Calcutta with the jute-growing districts of East Bengal. West Bengal raw jute is brought partly by rails and partly by rivers. As Calcutta is a port, raw jute is also sent to this place for export. Thus the supplies of jute are always available for mills. Coal is within easy reach of Calcutta and the distance of Ranigunj and Asansol coalfields is only about 120 miles. As a matter of fact, this proximity to the coalfields is a great advantage of Calcutta. Humid climate necessary for jute manufactures is also the characteristic of the Hooghly basin. Calcutta is an industrial centre and so there is a regular flow of labour from the neighbouring provinces of Bihar, Orissa and the Uttar Pradesh. At present more than 90 per cent. of the labour employed in jute mills comes from outside the province. Then again, the fact of Calcutta being a port makes the industry assured of supplies of imported machinery for mills.

The jute-mill workers are usually housed in dwellings provided by the mills at a nominal rent. These workers also enjoy free medical aid.

Calcutta itself is an important jute mill centre. The other centres are Bally, Agarpara, Rishra, Serampore, Syamnagar, Kakinara, Hooghly, Bansbaria, Ulubaria and Budge-Budge—all in the Hooghly basin and also within 40 miles of Calcutta.

There are four jute mills in the Madras State employing about 6,500 persons. Two of these are small units, the larger units being one in *Chitavalshah* and in *Nellimarlla.* These two

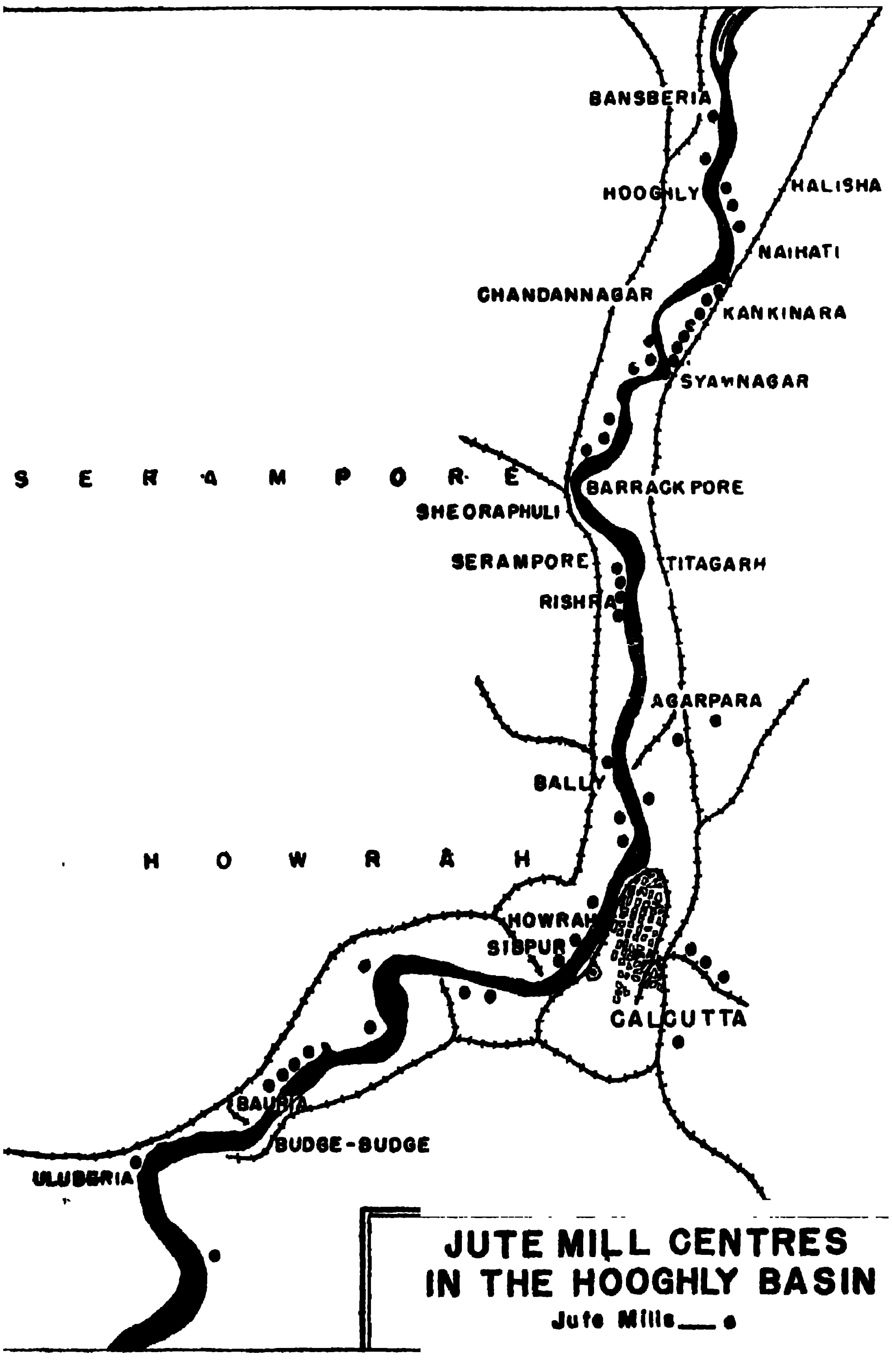

FIG. No. 136. All the jute mills of the Hooghly basin are within 40 miles of Calcutta.

big factories account for about 77 per cent. of the total labour force employed in the jute mills in South India. Chitavalshah in the Bimlipatam taluk (Vizagapatam district) is a jute village. Jute is grown in the vicinity but because of its poor quality only a small percentage of it is used by the factory, the rest being obtained from other areas. The jute mill at Nellimarlla (Vizagapatam district) employs about 2,000 workers.

In the Uttar Pradesh there are 3 mills located at *Kanpur* and *Sahjanwa*. Kanpur has two mills and employs 8,000 workers.

Jute manufactures may be divided into four classes: (*a*) gunny bags, used for packing rice, wheat, sugar, oil-seeds, etc. ; (*b*) gunny cloth or hessians ; (*c*) coarse carpets and rugs ; and (*d*) cordage. Fine and clean jute yarn of uniform size and quality is used in the cable industry. The jute products are mainly exported to the U. K., Germany, France, Italy, Egypt, South Africa, Australia, Java, Japan, Argentina, Canada, the U. S. A., Cuba and the Netherlands.

EXPORT OF JUTE MANUFACTURES

(*a*) Gunny bags, hessian and sacking—

1937-38 1938-39 Average	605 million.
1951-52	... 513 million.

The important buyers of jute bags during 1951-52 were Cuba (35 million), Burma (35 million), Thailand (26 million), Australia (70 million), U.K. (74 million), Chile (13 million), Argentina (12 million) and China (20 million).

(*b*) Gunny cloth-

1937-38 1938-39 Average	1596 million yards.
1951-52	··· 1084 million yards.

During 1951-52, the chief buyers of Indian jute cloth were U. K. (210 million yards), U. S. A. (508 million), Argentina (174) and Canada (66).

The United States of America is at present the best customer of India's manufactured jute goods. They take about fifty per cent. in volume of the annual exports of hessian cloth. In value they take about thirty per cent. of the total exports of jute manufactures of all kinds. U. K. is the next largest customer of hessian cloth but it takes only half of that of the U. S. A. Argentina takes about ten per cent. of the total exports of manufactured jute goods which include hessian cloth (ten per cent.), hessian bag (thirty per cent.), gunny bags, sacking cloth and sand bags. Australia takes a large quantity of sacking bags for wheat and wool. There is a considerable demand for twills in Egypt, the Levant, South America and South and West Africa.

The effect of the Second World War was not serious for manufactured jute trade since the continental Europe took less than five per cent. of the exports of manufactures.

Jute—raw and manufactured—represents 50 per cent. of the total exports of Indian merchandise from Calcutta to foreign countries. The jute trade, raw and manufactured, represents 20 to 25 per cent. of exports from the whole of India, the highest figure recorded being 28 per cent. in 1929.

The jute mill industry of West Bengal received a great setback after 1930. This was reflected in the exceeding low level of prices of raw and manufactured jute. Trade depression throughout the world and over-production of jute brought about the crisis. The introduction of substitutes and restrictions imposed on the free entry of jute in many countries aggravated the situation. In Cuba, Ecuador and the Netherlands restrictions were imposed on the free entry of jute products. In Germany, Rumania and Lithuania the restrictions took the form of regulation of imports by licence. Germany also prohibited the use of jute sacks for coal and wool. It was a part of the Italian industrial programme to substitute jute by home-grown fibre.

The displacement of jute in many foreign countries had developed along two lines: (*a*) the use of grain elevators and other mechanical appliances for the bulk handling of grain in countries like Australia, Canada and Argentina ; (*b*) the substitution of jute bags by bags of paper, cotton, sisal, hemp and other fibres. During World War II, when jute export was interrupted by the hostilities, many substitutes like cloth and paper bags became popular as packing materials and captured a part of the market. In other words, the progress of the jute substitutes was due to the scarcity of jute. New Zealand introduced *Phormium Tenax*—a vegetable fibre for domestic wool-packing industry: Russia and Argentina used *linseed fibre*: Canada, U.S.A., Sweden, South Africa and Australia widely used *cloth and paper bags.* If some of these substitutes are being used even now, it is because of the high price of jute in the post-war period.

The replacement of jute by processes of bulk handling is a permanent loss, but it is doubtful whether the substitutes of jute would compete ultimately with success. So long as the price of jute is kept within reasonable limits, there is no possibility of its being ousted from the international market by the substitutes. The problem of jute substitutes may be real—but not serious.* Therefore, the present and the future of the jute industry will depend entirely on obtaining raw jute at economic prices. Another factor that undoubtedly has some effect on the price of jute goods is the export duty.

The mill-owners realise that although markets may have been lost to competitive fabrics or in countries which are more and more tending to self-sufficiency, other new and valuable markets may be gained by research and experiment.

It must be borne in mind that any increase or reduction in export of jute goods is of very great significance. About a third of all India's foreign exchange earnings in 1948 came from jute and 66 per cent. of hard currency earnings had their origin in the same source. At present about 90 per cent. of the jute goods manufactured in India are exported.

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* From the point of view of jute mills, it is necessary to make a distinction between *jute competitors and jute substitutes*. Jute competitors are those which cannot be produced on jute mills machinery, as for example, paper, cotton, sisal and coir. The jute substitutes, on the other hand, are those fabrics which could be readily spun or mixed with jute. Such substitute fibres may be natural or man-made. The natural substitute fibres are manilla hemp, Caroa, bow-string hemp, Kenof, Bimli jute, Bombay hemp, Deccan hemp and Ambari. The first three are leaf fibres and the rest are bast fibres. There are today 50 possible substitutes which are fairly well-known.

The Indian Central Jute Committee has a laboratory for Technological Research at Calcutta for finding out the new uses of jute other than its employment as a packing material.

*The new lines of manufacture**

Housing: Heat insulation ; plastic furniture ; carpets and curtains ; upholstery ; blankets ; wall covering, etc.

Transport: Car upholstery ; water-proof covers ; tarpaulins ; canvas ; cordage and ropes.

Industry: Electric insulation ; plastic reinforcement.

Clothes: Mercerized and bleached fibres blending with wool and cotton.

In many of these new lines of manufacture, the jute industry has already made good progress.

The Sugar Industry

Although India is the accredited birth-place of sugar-cane she had to depend on foreign sources for supply of her requirements of sugar up to 1931-32. The sugar industry of India has developed considerably since the grant of tariff protection in 1932.† She has now become the largest sugar-producing country in the world with an output far in excess of its present estimated annual requirements. There are 134 modern sugar factories in the Indian Union.

The industry is mainly confined to the Uttar Pradesh and Bihar which might be regarded as the sugar-belt of India. The important sugar-manufacturing centres in these two States are Kanpur, Gorakhpur, Lucknow, Allahabad, Champaran, Muzaffarpur and Bhagalpur. Other sugar centres are Coimbatore in Madras, Belapur in Bombay and Amritsar in East Punjab.

There are now 134 Sugar factories in the country which annually produce a little more than 1 million tons of sugar.

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* Barker—*Jute Industry.*

† The protection of the industry expired on March 31, 1950.

GEOGRAPHICAL DISTRIBUTION OF SUGAR FACTORIES (1949)

Provinces	No. of Factories	Production (tons)
Uttar Pradesh (U.P.)	65	5,27,000
Bihar	29	1,84,900
East Punjab	1	9,700
Madras	9	51,000
Bombay	10	88,100
West Bengal	1	4,400
Orissa	1	3,400
Indian States	18	1,32,400
	134	10,00,000

Production of sugar in India may be classified under three heads—(*a*) by modern factories working with cane, (*b*) by modern refineries working with ***gur*** and (*c*) by indigenous pan concerns which may be collectively called *Khandsaris*. Of these three methods of sugar manufacture, it is only the first that gives what may properly be called the white sugar of India, and it constitutes the most important section of the industry. The ***gur***-refining industry as well as the *Khandsari* industry are very inefficient and wasteful. More than half the cane produced is used for the manufacture of ***gur***.

The Indian Union produced 1·2 million tons of sugar in 1950 for which 10 million tons of sugarcane had to be crushed.

As a result of the rapid development of the industry, the import of sugar has now practically disappeared and the country has been rendered absolutely independent of any foreign sources for the supply of sugar.

Judged by the standard of quality and grade, Indian sugar is now equal to that of Java.

In spite of such remarkable progress, there are certain drawbacks in the industry. The present weakness of the Indian sugar industry lies in the high cost of production which is due to (*a*) seasonal character of the industry, (*b*) defective methods of extracting juice from the cane, (*c*) great waste in refining, (*d*) poor output, and (*e*) the impossibility in most cases of concentrating cultivation round the central factory. These defects may be removed. Both the Government and the industrialists should pay attention to research and modernisation.

In Java the factories for turning the cane into sugar are near the plantations and the process of manufacturing sugar is so developed that there is no loss of sucrose. Attention is also paid in Java to the production of by-products like rum and methylated spirit. The sugar factories in India have no control over the sugarcane cultivation which is in the hands of ryots. These ryots possess small holdings of land and are not in a position to arrange for harvesting when the cane has reached maturity and is in the optimum condition. Moreover, in India sugar-cane areas are generally found at a great distance from the factories: as a result, the factories have to depend for their supply of the raw material on remote areas and thus to pay high costs.

The most important by-product of sugar is molasses which can be used for the manufacture of power alcohol and methylated spirits. So far the sugar industry of India has not given much attention towards this direction. Then again, bagasse which is the crushed cane after the removal of juice is used at present as fuel. Bagasse can be utilized for making wrapping paper and straw boards.

The sugar market in India is extremely elastic. The present high price of sugar has kept the market confined mainly to the rich and the middle class people. A little reduction in the price will bring the produce within the financial capacity of the poor. The Indian Tariff Board has recommended as a means of lowering the cost of production of sugar and expanding the industry: (1) shifting of factories in the U.P. and Bihar to more suitable localities; (2) allocation of sufficient funds to the *Indian Sugarcane Committee for carrying out its five-year plan of research and development and* (3) *fixation of sugar prices at a fair and reasonable level.*

The following figures will reveal the position of India as regards *per capita* sugar consumption in relation to other countries.

(In lbs.)

U.S.A.	103	Australia	114
U.K.	112	New Zealand	115
Denmark	128	India	24

Also due to high prices of Indian sugar, Pakistan and other Middle-East countries normally decline to import Indian sugar as they get sugar from Cuba and Brazil at cheaper rates. Sugar-cane accounts for 60 to 70 per cent. of cost of sugar. Sugar-cane cannot be cheaper unless there is more production of it, which can only be done by increasing the yield of cane per acre and also by improving the quality of cane. Any increase in the area of cultivation would conflict with the extension of areas under food or other crops which the country needs.

It will be observed from the figures given below how the factory prices of sugar soared high since 1938-39.

Year	Rs. per maund
1938-39	10 12
1944-45	16 4
1946-47	20 14
1947-48	23 7

The reduction in price will also help the industry to export the surplus production to Afghanistan, Tibet, Nepal, Burma, Ceylon and Pakistan. Pakistan can take more than 350 million lbs. of sugar from the Indian Union. The European countries can also be supplied with Indian sugar now that India produces a superior quality and higher grade of sugar equal to those of Java. India exported during 1951-52 10,000 tons of sugar as compared to 71,00 tons in 1949-50.

The position of West Bengal in the production of sugar is at present not satisfactory. West Bengal is a large sugar-consuming province in India, but she has only three sugar factories. The present is, therefore, the most opportune time for starting more sugar mills. West Bengal enjoys certain natural and economic advantages for the cultivation of sugar-cane. In the U. P. and Bihar, the production of sugar-cane per acre is between 15 and 16 tons, while in West Bengal it is as much as 35 tons, sometimes 40 tons. The soil and climate of North-West Bengal and 24-Parganas are favourable to sugar-cane cultivation. West Bengal has also the advantage of a large local consuming market; economy in railway freight charges on finished goods is also an additional advantage for her over the U. P. and Bihar. As regards availability of cheaper power West Bengal stands in a very favourable position in comparison with the U. P. A very large coal-field lies near at hand and her excellent railway system and riverways bring this source of mechanical power at a cheap cost to the doors of the mills. But the great disadvantage of the Bengal sugar industry is that the port of Calcutta brings other sugar-producing countries within easy reach of Bengal markets.

Tea Plantations

India is the second largest tea-producing country in the world. About 80 per cent. of the Indian tea is obtained from Assam and West Bengal. Southern India raises nearly 18 per cent. of the total output, the rest comes from East Punjab and Bihar. The production of tea in Northern India amounted to 463 million lbs. in 1949 and in Southern India to 105 million lbs.

There are more than 5,000 tea plantations in India, of which 50 per cent. is confined to the East Punjab and 20 per cent. to Assam. But the average size of a plantation in the Punjab is only 4 acres, whereas in Assam the average size exceeds 400 acres.

"Every garden of any importance has its own factories where tea is prepared for the market, as it is essential that the various processes should be carried through immediately after the leaf has been plucked. The better organised factories are elaborately equipped with highly specialised plant and are under the supervision of expert tea-makers."

The Indian tea industry employs more than a million labourers, recruited mostly from the Uttar Pradesh, Bihar, Madhya Pradesh, Madras and Orissa. Assam employs in the tea-plantations more than half a million persons ; in West Bengal the number is a little above 200,000. The question of labour is a difficult problem in Assam, where the local labour is generally unwilling to work in the plantations, because it finds in the cultivation of land a more easy occupation. Labour is employed in Assam on a contract system—the workers agreeing to remain at a stretch for certain years in a garden.

The second largest item in India's export trade is tea. Internal consumption of tea absorbs about 25 per cent. of the production, while the rest is available for export. The U. K., Canada, Australia, Egypt, the U.S.A., France and New Zealand are the chief buyers. The U. K. is the single largest buyer and takes as much as 60 per cent. of the export.* It is probably true to say that no other country in the world is so dependent on one consuming country for its prosperity. Although India is the greatest tea-exporting country in the world, several other countries like Ceylon, Java, Sumatra, China, Japan, Formosa and Indo-China produce tea and compete with India in European and American markets.

There is also a great scope for the expansion of the market for Indian tea in Iran, Egypt and the U.S.S.R.

PERCENTAGE OF INDIAN TEA IN THE TOTAL IMPORTS OF TEA AND COFFEE IN CERTAIN COUNTRIES IN 1939-40

U. K.	60
Canada	56
U.S.A.	12
France	8
Australia	4
New Zealand	3

It is evident from the above figures that the competition is severe in the U.S.A., France, Australia and New Zealand. The U.S.A. and Canada favour the Ceylon type of tea which yields a flavoury liquor.

There is also great scope for development of internal market for Indian tea. *The Central Tea Board* is carrying on extensive propaganda throughout India, as a result of which the demand for tea has increased considerably.† The Board claims that in Madras and Bombay more than 60 per cent. of the former drinkers *have become regular visitors to the tea shops.* The Board spends more than Rs. 20 lakhs on propaganda work in India.

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* The supply of tea to the United Kingdom was once monopolised by China, but in 1840 India and in 1876 Ceylon, set out to break that monopoly and such success attended their efforts that in 1927, more than 83 p.c. of British needs of tea came from these two countries. [Vide *Empire Stock Taking* by Grondona (1930)].

† The intensive advertising campaigns initiated by the Board have already borne fruit in several countries; and apart from India and the United Kingdom itself, the potential markets in America, Egypt and South Africa offer a vast field for operations.

The tea industry has had a continuous run of prosperity throughout the War years of 1939-1945 as the supplies of Indonesian tea were cut off from the world market. The International Tea Committee had to raise the export quota of tea from India.

PRODUCTION OF TEA

	Million lbs.
1938-39	452
1940-41	463
1941-42	470
1943-44	573
1948-49	532

In 1950, tea production in Indian Union was 567 million lbs. compared to world's total of 815 million lbs. In the same year the world demand for tea was to the extent of 848 million lbs. Hence the supply is still short of demand. Recently the Government of India has levied an export duty of As. 4 per lb. of tea. Till the production of tea is revived in Indonesia, Japan and Formosa, the export duty will not affect the tea trade.*

There has been a large increase of export of tea to Canada, U.S.A. and Australia from Indian Union. In 1951-52, India exported 426 million lbs. of tea of which the U.K. took 287 million lbs., U.S.A. 26 m., Iran 11 m., U.S.S.R. 5 m. and Canada 19 million.

The present problems of the Indian tea industry are (*a*) the acute shortage of chemical fertilizers, (*b*) shortage of plywood tea chests and (*c*) the deterioration in the quality of tea. Further progress of the tea industry will depend on the solution of these problems. It is also necessary to make more propaganda for Indian tea in foreign markets. Indian Tea is losing grounds in U.S. markets because of its deterioration in quality and growing competition from other sources. *As tea is a good dollar earner, it is necessary to give immediate attention to this*

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* Although tea production has increased considerably, the internal consumption of tea has also increased. For this reason, further expansion in the export of tea will not be possible unless production is increased or domestic consumption is curtailed.

problem. In 1951-52, the U.S.A. took tea worth Rs. 6·29 crores and Canada Rs. 4·31 crores.

The partition of the country gave rise to problems in regard to transport resulting in high costs. Calcutta's railway link with the tea-gardens ran through Pakistan territory and coal-supplies had to be sent through a new route involving motor transport over difficult hill roads. This increased the cost of manufacture. Now there is a direct railway link between West Bengal and Assam through Bihar.

The Government of India after consulting the Indian Tea Licensing Committee have announced that the Indian export allotment of tea for the financial year 1952-53 shall be 452,720,021 pounds, being one hundred and thirty per cent. of India's standard export figure.

The Silk Industry

The Indian silk industry was once in a very flourishing condition. During the sixteenth and seventeenth centuries, India, and more especially Bengal, occupied an important place in silk production and trade. The industry declined as the result of the competition of the silk yarn and silk piece-goods from Italy and Japan. In more recent years Chinese silk and artificial silk manufactures are competing severely with the silk-weaving and spinning industry in India.

India is a great raw silk producer. Various silkworms are reared in different parts of the country. The varieties are the mulberry silk, *tasan* silk, *endi* and *muga.*

There are three principal areas where raw silk is found: (*i*) Southern portion of the Mysore plateau with the Coimbatore district of Madras, (*ii*) the Murshidabad, Malda and Birbhum districts of West Bengal, (*iii*) Kashmir and Jammu with the neighbouring districts of the East Punjab. There is also a considerable cultivation in Chotanagpur and Orissa and parts of the Madhya Pradesh of the *Tasar* silkworm and in Assam of the *Endi* and *Muga* silkworm. Silk is also obtained from North Bihar. Kashmir is the most important producer of silk in India where silkworms thrive best in the mulberry trees. Silk industry is a State monopoly there and the major portion of the products is exported to Europe.

The silk industry of India is an important national asset with strongly marked characteristics. It consists of two well-defined sections:

(1) The production of cocoons; and
(2) The production of raw silk, including the utilization of by-products.

The first one is essentially a cottage industry, and the second is a factory industry.

SILK-PRODUCING AREAS IN INDIA

Name of area	Silk reeled lbs.	Name of area	Silk reeled lbs.
Mulberry Silk:		Tasar Silk:	
West Bengal	10,00,000	Bihar & Orissa	2,40,000
Mysore	7,40,000	M. P.	1,60,000
Kashmir	2,32,000	U. P.	1,000
Madras	90,000		
Assam	6,400	Total	4,01,000
East Punjab	1,000	Other Silk:	
		Assam Muga	1,00,000
		Assam Endi	50,000
Total	20,69,400	Grand Total	26,20,400

Silk manufacture is a cottage industry in India. The bulk of the raw silk produced in India is consumed by the handloom-weaving industry. Although there are 90 silk factories in the Indian Union, at present only three mills use power-driven looms for silk manufactures—one in Bengal, one in Mysore and one in Bombay.

The chief silk-weaving centres are Amritsar and Jullundhar in East Punjab; Banaras, Mirzapur and Shahjahanpur in the U. P.; Murshidabad, Bankura and Bishnupur in West Bengal; Nagpur in M. P.; Bhagalpur in Bihar; Ahmedabad, Poona, Belgaum, Dharwar, Hubli and Sholapur in Bombay; Bangalore in Mysore State; Berhampur in Orissa; Trichinopoly, Salem and Tanjore in Madras; Srinagar in Kashmir.

Mysore silk industry produces more than two-fifths of the total output of silk manufactures in India.

The different districts of West Bengal specialise in manufacturing typical varieties of silk fabrics. *Sonamukhi* in Bankura and *Islampur* in Murshidabad made shirtings of various designs while *Bishnupur* in Bankura and *Mirzapur* in Murshidabad specialise in dhoties and saries. The Bengalee weavers buy both foreign and Indian silk. The Indian variety is obtained in Bengal, Banaras and Surat. The foreign sources are Italy, Japan, France, U.S.A. and U.K.

In order to improve the condition of the silk industry in India it is necessary to have State support. The silk weavers are all poor and, therefore, cannot buy the necessary implements. They are also exploited by middlemen. These evils can be removed to a certain extent through co-operative society.

Though India is a large producer of silk, she has not been able to capture any foreign market. France and the United Kingdom import small quantities of raw silk. India exports cocoons, because reeling is so badly done that foreign countries prefer to do the reeling themselves.

During 1951-52 India exported 868,414 lb. of raw silk abroad compared to 560,917 lb. in 1949-50. About 300,000 yards of silk piece-goods were exported from India during 1951 52.

Rayon or staple fibre is produced from wood-pulp by forcing vicose through minute holes to form filaments which are cut into short lengths or staples which can be spun on ordinary cotton machinery after a little adjustment. It is the generic term for manufactured textile fibre or yarn produced chemically from cellulose.

The present condition: India imports a large quantity of artificial silk from Italy, Japan, the U.K., France and other countries. The great demand for silk on the one hand, and the absence of any artificial silk industry in India on the other, indicate great possibilities. The necessary raw materials for artificial silk are available in India.

The Dehra Dun Forest Research Institute has observed that rayon can be manufactured in India from "fibro", a product obtained from grass and bamboo pulps. The forest wealth of Travancore and Mettur can be used for manufacture of "fibro" with the help of cheap power obtained from the Pallivasal Hydro-electric Project. Moreover, in India large quantities of cotton and cotton waste are available and this can be used in the artificial silk industry. "The percentage of yield of artificial silk from cotton is far greater than that from wood-pulp ; wood-pulp yields 30 per cent. and cotton 85 per cent." The chemicals required are caustic soda, carbon disulphite, ammonium sulphate, white soap, bleaching liquid etc., which are mostly available in India. As plentiful supply of water free from chlorides is necessary, the industry should be localised on river banks having transport facilities.

At present India imports rayon yarn for the purpose of manufacturing rayon piece-goods. There are about 300 mills in India for weaving rayon. In fact, the rayon industry has become second to cotton industry in importance. The main problem is the absence of rayon manufacture.

There is considerable demand for Indian rayon in Kuwait, Afghanisthan, Pakistan, Ceylon and Sudan. During 1951-52 India exported 8·4 million yards of rayon piece-goods worth Rs. 1·1 crores.

The Woollen Industry. Indian wool is known in the world market as *East India Wools.* There are about 40 million sheep in India which are reared mostly in Northern India. The annual wool production is nearly 55 million lbs. Indian wool is short-stapled and is inferior to that of Europe and Australia. Raw wool is obtained from the Punjab, particularly the Hissar district ; Garhwal, Almora and Nainital in the U. P., and Bikanir. Due to variations of climate and topographical conditions, the production of wool varies widely in different parts of India. Where the land is undeveloped and climate suitable, *i.e.,* Rajasthan, sheep are kept in large flocks for wool production. In Bengal and Orissa, the industry is scarcely organised due to unfavourable climate which does not permit rearing of wool-weaving sheep. In South India the sheep have degenerated to such an extent that they bear fibre which is more akin to hair than wool. There are twenty-two woollen mills in the Union. In addition, there is a large number of handloom producers. The first woollen mills were set up about 1876 at Kanpur and Dhariwal because of availability of cheap labour and water supply.

Indian wool is suitable for the manufacture of carpets and blankets which are made at Amritsar, Srinagar, Bangalore, Agra, Mirzapore and Kanpur. Shawl is a cottage industry product of Kashmir. The finest wool comes from the Bikanir State and is used in the mills. Modern mills are mostly localised in Dhariwal and Kanpur.

For the manufacture of woollen cloths in the few mills established in India wool is chiefly imported from Australia. The average annual import of raw wool is of the order of 19·24 million lbs.

If proper care is taken to improve the sheep-breeding and to produce better and cleaner type of wool Indian Union can possibly become less dependent on foreign supplies.

The utilization of wool by Indian mills may be classified as follows: *

(*a*) Indian plain wools—
  (*i*) Coarse types: Blankets and carpets.
  (*ii*) Finer types: Tweed, overcoatings, rugs, serge yarn.
(*b*) Hill types—low grade hosiery and army blankets.
(*c*) Cross-bred wools—Medium serge warps, worsted warps, tweeds, etc.
(*d*) Merino wools—Flannel, overcoating and superfine broad cloths.

	p.c.
Blankets	49·6
Modern mills	28·7
Carpets	11·6
Yarn for sale	6·8
Other uses	3·3

A serious handicap from which the Indian woollen industry suffers is the fact that the season for wearing woollen cloths in India is about 4 months in a year, and the mills are to manufacture for many months in anticipation of a demand which may not be realised.

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* *Vide* Brochure on the marketing of wool in India (1948).

The woollen manufacturers of India have formed a Federation to avoid rivalry and competition among themselves. This federation is known as the Federation of Woollen Manufacturers in India.

Indian wool is also exported outside. Indian manufactured wool in the shape of carpets, rugs, piece-goods and shawls are exported to U.K., U.S.A., Canada and Australia. One important problem that confronts the export industry is that the quality of wool that is being sent outside is not properly graded. This has an adverse effect on the industry.

EXPORTS OF WOOLLEN GOODS

	1949-50	1950-51	1951-52
Carpets and rugs (in million lb.) ..	10·4	14·0	11·6
Piece-goods (in yards).	31,887	21,225	63,788
Shawls (in number)	48,071	56,008	39,309
Other sorts of woollen manufactures (in million lb.) ..	1·3	1·5	1·2
Total value of all woollen goods (in crores of rupees) ..	3·6	6·0	6·4

The Iron and Steel Industry

Indian Union is the second leading iron and steel producing country in the British Commonwealth of Nations and yields place only to the United Kingdom. Although her output of iron ore cannot be compared with those of the U.S.A. and France, her reserves of ore are so vast that there is every hope that India will eventually take an important place among the producers of iron goods. The principal iron-ore deposits are found in Bihar, Orissa, Madhya Bharat, Mysore and Madras. The most important iron belt extends from Gurumahisani in the Mayurbhanj State of Orissa through Keonjhar and Bonai to the Kalhan sub-division of Singhbhum. "Most valuable deposits occur in the chain of hills extending over 30 miles from Kompilai in the Bonai State to the neighbourhood of Gua in the Singhbhum district as in this area we get about 60 per cent. of the total deposits of this belt."

The value of an iron-ore deposit depends not only upon its richness in iron, but also upon its location and the ease or difficulty of mining. In India the various other metallic ores required in extracting iron from the ore are also available in abundance not far from the iron deposits. Manganese ore, for example, occurs in the Singhbhum district. Again, dolomite and limestone are found within a short distance of the ore-fields.

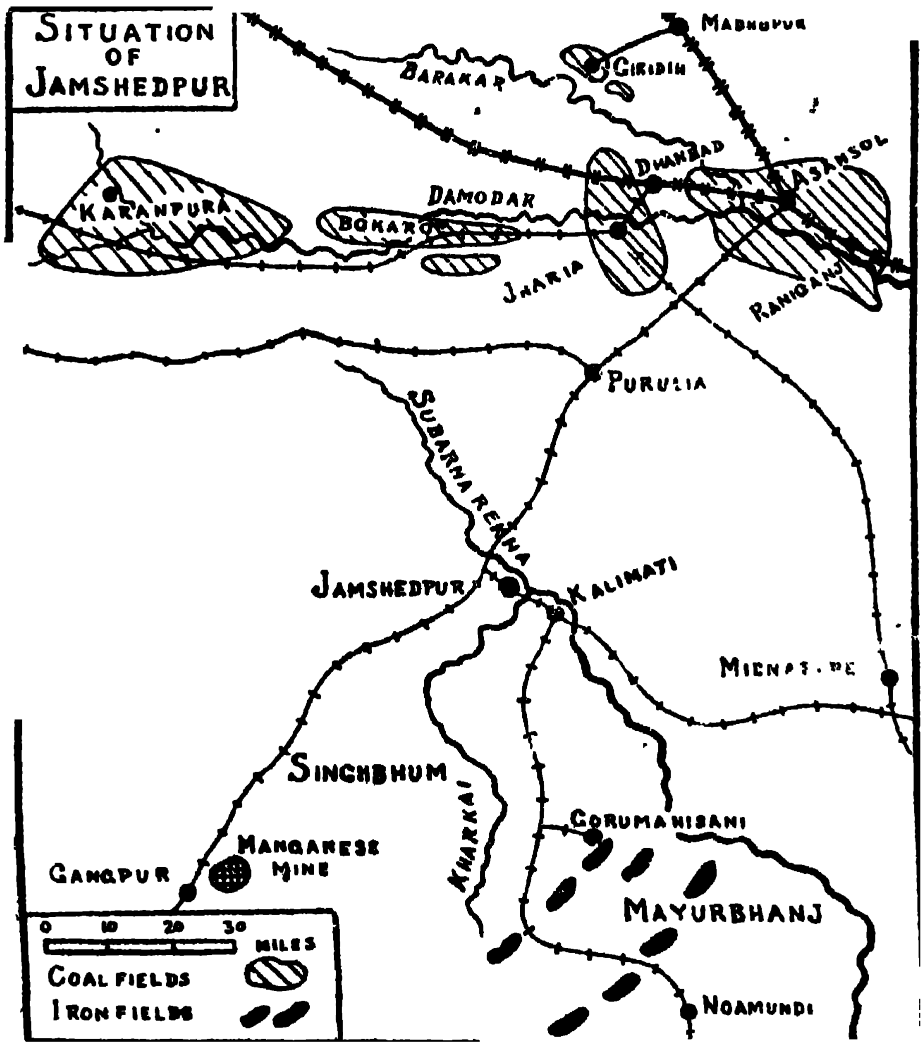

FIG. No. 137. The location of Jamshedpur with its sources of raw material supply. Notice the coal-fields in the north and the iron-fields in the south-east of Jamshedpur.

The iron and steel industry is now recognised as one of the biggest industries in India. It gives employment to nearly 35,000 persons. The first iron and steel company was started in 1830, but the real development began after 1908 when the Tata Company was established at Sakchi in the Singhbhum district. At present the major companies chiefly engaged in the making of iron and steel are the following :

(*a*) Tata Iron and Steel Co., Ltd.—It owns valuable iron-ore concessions in the Mayurbhanj State of Orissa and Raipur district of the Madhya Pradesh, magnesite and chromite in Mysore and coal in the Jharia field.

(*b*) Indian Iron and Steel Co., Ltd.—It manufactures pig iron, steel, ferro-manganese, etc., at Hirapur and Kulti.

(*c*) Steel Corporation of Bengal brings iron from Keonjhar mines. The centre is at Burnpur.

(*d*) Mysore Iron-works at Bhadravati, Mysore.

It is not possible now for India to produce machinery, higher grade of cutlery, high-grade steel and rolling stock. She manufactures mainly pig iron, iron bars, steel tubes, tin plate, enamel wares, wires, nails, railway wagons, etc. India possesses unique advantages for the production of pig iron of which she is the cheapest large-scale producer in the world. The Tata Company also produces about 70 p.c. of India's pig iron. The Indian iron and steel industries are enjoying fiscal protection as manufacturers of basic materials.

India exports a large quantity of pig iron and steel manufactures. The bulk of the shipment goes from Calcutta. Madras also handles a considerable quantity. The chief markets for pig iron are the U.K., the U.S.A., Japan and China, while scrap iron and steel for re-manufacture go mainly to the U.K. and Japan.

PRODUCTION OF IRON AND STEEL IN INDIA

(*In 000 tons*)

	1938-39	1946-47	1948-49	1951-52
Pig iron ..	1,576	1,356	1,572	1,704
Casting ..	88	1,224	1,380	1,488
Steel ingots ..	977			
Semis ..	791	872	—	1,248
Finished steel	726	990	1,041	1,045

India's requirements for steel are estimated at 2·5 million tons a year of which only 1 million can be now produced in the country.

Jamshedpur, the centre of the Tata Iron and Steel Company, is the principal seat for the manufacture of steel in India. It owns valuable iron-ore concessions at Gurumahisani, only 50 miles away. Iron ore is also brought from Salaipat, Badampahar and Noamundi mines in Singhbhum. Coal is brought from the Jharia field, the distance being only 100 miles. Manganese is available in Malda, 30 miles south of Noamundi, Limestone and Dolomite are obtained from the neighbourhood, in Panposh on the Brahmani Valley in south-west Singhbhum. The centre is connected by railways and the cost of transportation is never high. Cheap labour is always available from Madhya Pradesh and Chotanagpur. The river Subarnarekha, though useless for navigation, supplies water to the industry. During summer this river dries up and, therefore, arrangements have been made to preserve water in the Kharkai river by constructing a dam.

PRODUCTION IN TATA IRON AND STEEL COMPANY

(In 000 tons)

	1947	1948
Coke	933	960
Pig iron	956	1,075
Steel ingots	901	1,029
Steel goods	664	752

The Eastern Railways (formerly parts of the Bengal Nagpur Railway) with its branch lines, serve the industrial city for moving the raw materials and the finished products.

Burnpore is the second largest iron and steel centre in India. The city is 142 miles from Calcutta and the industry is managed by the Indian Iron and Steel Corporation Ltd. In 1936 the Bengal Iron Co., Ltd. was amalgamated with it. The output of the pig iron of the amalgamated companies in 1937 was 7,13,000 tons. The companies also manufacture foundry iron for castings.

In Mysore the iron-ore deposits exist in the Bababudan hills and in the Shimoga district. The iron industry is localised at *Bhadravati.* The forests of the Shimoga and Kadur districts supply charcoal for smelting iron ore. Limestone comes from Bhandigudda.

varieties, rag, hemp, jute waste and waste paper are used. Bamboo pulp is used only in Naihati, Bengal.

The supplies of bamboo in areas where the other conditions are favourable for its exploitation are sufficient to meet the needs of all the paper mills in India and leave a surplus from which an export trade in pulp can be developed. It grows extensively in Assam, Madras and Bombay. The advantage of bamboo is that the cutting rotation is on average four years as against 60 years in the case of wood. Further, the dead bamboo stems remain suitable for the manufacture of pulp for at least 4 years. Its yield is larger than sabai grass and cost, cheaper. Of course, as a raw material, bamboo is inferior to sabai grass ; but, in India, the demand for superior quality paper is limited. The prospect of the bamboo paper-pulp industry is, therefore, quite bright.

The paper industry of India is working under certain disadvantages. The necessary chemicals, like caustic soda, soda ash, salt cake, bleaching powder and dyes, are to be imported from abroad at high prices. Moreover, these chemicals are to be brought to the mill-centres from the ports, and the transport charges are heavy. The problem of power is no less acute. Most of the mills are to pay heavy charges for coal as the best coalfields are mostly confined to the Damodar basin of Bihar-Bengal. The total quantity of paper of all kinds imported by India before the war was 2·5 million cwts. The question of foreign competition, however, need not be taken seriously. Norway and Sweden can never afford to dump paper into India as these countries manufacture paper mostly for foreign markets Dumping is possible when the domestic consumption is adequate enough to make good the loss.

It is not possible to make newsprint in India with grass or bamboo-pulp. At present India is wholly dependent for newsprint on imports from foreign countries. The establishment of a newsprint industry in India is a vital national necessity. Experiments show that newsprint can be manufactured in India from the Indian spruce, paper mulberry and pula. Indian spruce occurs in the hills of East Punjab, the U.P. and Kashmir. But owing to wartime fellings in the accessible areas, the wood is not available in regions where cost of extraction will prove to be economical. Paper mulberry species grows very fast and thrives in tropical climates. It attains to a pulp-wood size in 7 to 10 years of growth in natural course as against 60 to 70 years in the case of spruce and fir. Paper-making tests with this pulp were carried out by the Forest Research Institute of Dehra Dun and it was found that the strength characteristics of the newsprint were more or less as those of the sample of the imported newsprint. It is expected that the production of newsprint in India will soon begin on a commercial scale.

Expensive rag papers, art paper, blue match paper, etc. are not likely to be made in India in near future. Recently, however, a mill for the production of tissue paper has been founded at Tribeni, Hooghly. A newsprint factory is being set up in Madhya Pradesh. Other ideal places for the location of mills for the manufacture of newsprint are Kashmir, Hyderabad and Tehri Garhwal State.

India imports paper from U.K., Norway, Sweden, Germany, Japan and Holland. About one-fourth of the imports comes from U.K.

With the outbreak of the Second World War, imports from these countries ceased and Indian paper-mill industry got an excellent opportunity of expanding and consolidating its position. The growth of the paper industry in India will be evident from the fact that within 20 years the production has gone upto 104,000 tons in 1949-50 from about 55,000 tons in 1933.

In 1951-52, the production of paper in the Indian Union was 123,000 tons. Although the paper industry has increased its production considerably, the output is not yet adequate to meet the entire requirements of the country. The demand has, therefore, increased for hand-made paper as well.

It is expected that, in course of time, Indian paper industry will supply the entire requirement of India and will also be in a position to export paper outside. The possibilities of export are in the direction of Burma, Ceylon, Malaya and East Africa where at present there are no paper mills.

Chemical Industry

The Indian Union has now 35 chemical factories. The chemical industry has made enormous progress during the last few years. The range of manufactured products has greatly increased, and besides factories of basic products, raw materials for agriculture and industry, the Indian Chemical industry manufactures many articles for direct consumption.

Chemical industry supplies materials which are used in other industries or agriculture. The production of soap, leather, glass, paints and varnish, drugs, rubber, etc., requires chemicals without which they cannot be manufactured.

The chemical industry can be divided into:

(*a*) Heavy chemicals.
(*b*) Coal-tar chemicals.
(*c*) Electro-chemicals.

Heavy chemicals include mainly sulphur and its compound, acid hydrochloric, soda ash, caustic soda and fertilizers. The importance of heavy chemicals lies in the fact of their being essential for other industries like textiles, leather, paper, etc., and their consumption depends on the activity of those industries.

The second World War was responsible for the birth of a heavy chemical industry in India. The curtailment of imports, the shortage of shipping facilities and the consequent demand for increased local production of different types of chemical goods provided ample cause for an accelerated tempo for the development of chemical industry. At present several types of heavy chemicals are manufactured in Bombay, Calcutta, Delhi, Kanpur, Amritsar, Madras and Bangalore, but the production is not sufficient to meet the requirements of the country. India's sources of raw materials for heavy chemicals are not deficient if only the various mineral ores are properly treated. Salt, limestone, gypsum, bauxite, zircon, ilmenite, beryl, monazite, kaolin, etc., are found in abundance. In regard to fuel, the problem is very serious, because except Bengal, cheap coal is not available in other centres like Delhi, Madras, Bombay and Bangalore. The present hydro-electric schemes of the South need further expansion for supplying cheap electric power. The chemical plants, which are regarded as essential for building chemical industries, are not made in India, but if proper attempts are made, much of the simpler plants could be locally manufactured.

Coal tar is the foundation of the organic chemical industry from which benzole, anthracene and anthracene oil are obtained for use in dyes, explosives, flavouring essences, perfumes, plastics, pharmaceutical and photographic chemicals. Coal tar production and its distillation are centralised in Calcutta, Kulti, Jamshedpur, Bombay, Jharia and Hirapur. The Electro-chemical industry is of recent origin in India. Among the many products, the chief are calcium carbide, aluminium, magnesium and ferro-manganese. In many of these industries, electrical energy forms the major portion of the cost of the product, success or otherwise of the industry being largely dependent on the rate at which power is made available to the industry. With the completion of Hydro-electric projects now under construction, abundant power will become available and it will be possible to establish many electro-chemical industries in Bengal, Bombay, Madras, Bihar, Mysore and U.P.

In 1948-49 India imported chemicals to the value of Rs. 29·89 crores. The imported chemicals consist of sodium compounds, sodium carbonate, caustic soda, acids, potassium compounds, sulphur, bleaching powder and glycerine.

SHARES OF THE PRINCIPAL SUPPLYING COUNTRIES IN THE TOTAL IMPORTS OF CHEMICALS IN INDIA

	Per cent.		*Per cent.*
U.K.	60	Italy	5
Germany	8	France	8
U.S.A.	12	Japan	5

Glass Industry

Glass manufacture has been known in India since time immemorial. Crude glassware and ornaments have been found dating back to the early centuries A.D. In the 16th century there was an established glass industry in India which produced bangles and small bottles. The credit for the growth of glass industry on modern lines in India goes to the oldest factory at Bombay which was started in 1908 as a result of the Swadeshi movement. One Mr. A. D. Kale collected a few thousands from the masses collecting one pice from each contributor and started the Paisa Fund Glass Works at Telegaon with the help of certain political leaders.* But it assumed the character of a modern industry with the outbreak of the War of 1914-18, when Indian manufacturers made considerable efforts to fill the partial void created by the stoppage of imports from Czechoslovakia, Belgium, England and Germany.

It has a wide geographical distribution in India. There are 131 glass and glassware factories scattered all over the country giving employment to more than ten thousand people. In addition there are 93 factories for making bangles and pearls. Though it is a very old industry, its development has been comparatively very tardy. With the end of the war of 1914-18, the foreign competition reasserted itself. With a view to protecting the indigenous industry the Government imposed an import duty of 30 per cent. on glass bangles and 15 per cent. on glasswares. The duty was further increased in 1931. By 1932 there were 59 factories. Thereafter the number of factories continued to increase. The distribution of glass factories in 1950 was as follows:

Uttar Pradesh	24	Madhya Pradesh	6
West Bengal	34	Madras	4
Bombay	32	Delhi	3
Bihar	8	Orissa	1
East Punjab	7	States	12

The industry is carried on under two systems: (*a*) the indigenous cottage industry, and (*b*) the modern factory industry.

The indigenous glass industry is spread all over India, but the chief areas are the Firozabad district of the Uttar Pradesh and the Belgaum district of Bombay. Similar types of cottage industry also exist in Mysore. The indigenous glass industry had to face competition from the factory industry which started manufacturing the rough type of bangles in competition. On top of this, the competition from Japanese manufactures in bangles and other ornamental types was there. As a result the cottage industry is today restricted to the rough products and is on a smaller scale.

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* Report on the labour conditions in the glass industry by B. P. Adarkar (1949).

The modern factory industry is more or less restricted to the production of the following classes of goods:

(1) Glass cakes for bangles.
(2) Beads, bottles, lampware, phials, table wares, etc.
(3) Sheets and plate glass on a limited scale.
(4) Surgical and laboratory requirements in glass in special cases.

The Uttar Pradesh, Bombay, and West Bengal are the three main provinces for glass factories.

Glass industry has developed to a considerable extent in the Uttar Pradesh where 74 factories manufacture bangles, hollow and pressed wares, glass sheets, etc. *Bahjoi* in the district of Moradabad is the only glass-sheet making centre in India. Bangles are mostly made at Firozabad. It supplies nearly one-third of the country's demand. So complete is the concentration of the bangle industry at Firozabad that practically no bangles other than the *indigenous* (*desi*) bangle of the cottage workers are made elsewhere in India. The industry is, however, decentralised at Firozabad and all the processes are carried on in cottage shops employing 5 to 35 persons in each. Hollow and pressed wares like motor head-lights, reflectors, bulbs, chimneys, etc., are produced in Shikohabad, Hathras, Naini and Bahjoi. The factors that led to the success of the glass industry are the availability of sand, potash, nitrate and lime in the province itself. Coal is imported from Bihar and West Bengal. There are, however, certain drawbacks in the glass industry of U.P. The designs of bangles and glasswares are all old-fashioned and are mostly imitations of the Japanese brand or Moradabad brass-wares. The industry is in the hands of small dealers, and as such it is not properly organised.

Lamp wares, bottles, glass tubes, flasks, beakers, test tubes, plate glass, etc., are mostly made in Bengal and Bombay. There are 32 glass factories in Bombay, employing about 4,500 workers. In East Punjab, the principal centre of industry is Amritsar with its four glass factories. These factories produce mostly bottles. There is also one factory at Ambala which produces both scientific goods and hollow wares.

The most commonly used raw materials are sand, borax, soda ash, salt cake, dolomite, limestone, saltpetre, sulphur, manganese dioxide and colouring materials. Sand which is required in bulk is available in the various parts of the country with varying quality. Borax is not now found in India and has, therefore, to be imported from U.K. and U.S.A. There are abundant supplies of good quality dolomite, saltpetre and limestone in the country. The other raw materials like sulphur, manganese dioxide and colouring materials are imported. The main difficulty of the Indian glass industry today is the procurement of soda ash which is now partly imported and partly obtained from the Indian soda ash factories.

The future of the glass industry is indeed bright. The home market is fairly large and many of the raw materials are found in large quantities. The Indian glass industry is in a position to export glass and glassware to foreign countries like Aden, Bahrein Island, Ceylon, Burma, Malaya, Arabia, Iran, Afghanisthan, Indonesia and Indo-China.

Aluminium Industry

India possesses large reserves of bauxite suitable for the manufacture of aluminium. Deposits of bauxite are available in Madhya Pradesh, Orissa, Bihar, Madras, Kolhapur, Bombay, Jammu and Kashmir.

Aluminium has recently assumed great importance as a metal because of its lightness, corrosion-resistance, electrical conductivity and ease of fabrication. The metal is used in transport, chemical, brewery and food industries, building and architecture, insulation and paints. The aircraft industry is entirely dependent on the use of aluminium alloys. The metal is also used for bus bodies and railway coaches. Aluminium vessels are much more suitable for use in the kitchen than those of other metals. Aluminium containers are also replacing containers of tin plates.

The Indian Aluminium industry is located at *Alwaye in Travancore, Belur and Asansol in West Bengal and Muree in Bihar.* The aluminium work of Alwaye has a capacity of 2,500 tons a year and uses hydel power from the Pallivasal Scheme. A new aluminium centre is being opened near Katni in Madhya Pradesh. The annual production is about 4000 tons.

PROGRESS OF ALUMINIUM PRODUCTION IN INDIA

Year	Production (tons)	Year	Production (tons)
1946	3,000	1949	3,491
1947	3,223	1950	3,591
1948	3,367	1954	4731

The cost of production is still very high. The imported metal, however, does not very much compete with Indian production. India imports annually about 7,000 tons of aluminium goods.

Leather Industry

The main factors for the location of leather industry are the following: (*a*) plentiful supplies of hides and skins; (*b*) plentiful supplies of good water; (*c*) nearness to chemical supplies; and (*d*) good supplies of tanning materials. Indian leather industry can be divided into two categories—(*a*) indigenous and (*b*) modern.

The indigenous process is employed for crude leather, sole leather and half-tanned leather. A varam or turwal bark (*Caussia Auriculate*) is generally used for tanning though the use of wattle bark is not uncommon in Madras. The indigenous tanning is done by the *Chamars*.

Modern tanning uses *babul* bark and myrobalans in dealing with hides. Such processes have been introduced in Kanpur, Agra, Calcutta, Delhi and Madras. Batanagar, near Calcutta, makes footwears on a large scale. Chrome process has been recently introduced in India and Madras has done much pioneering works in this direction.

Hides (the skins of the larger animals) and skins (the skins of the smaller animals) are the chief raw materials of leather industry. India is the world's major supplier of raw and half-tanned hides and skins. She produces annually about 20 million cattle and 3½ million buffalo hides, 22 million goat and kid skins and 3 million sheepskins. In the production of cattle hides, India stands first in the world. In 1948-49, the

Indian Union produced 979,000 buffalo hides and 1,087,000 cow hides in organised units.

About 60 per cent. of the raw hides and 40 per cent. of the goat and sheepskins are tanned in India and the remainder is exported raw. In 1949-50 India exported raw hides and skins worth Rs. 412 lakhs, while exports of half-tanned leather were worth Rs. 686 lakhs. The United Kingdom alone takes about 50 per cent. of the Indian exports of hides and skins, the U.S.A. coming second with about 30 per cent.

India supplies about 30 per cent. of the goatskins of the world. The Indian goatskins are considered to be the best raw materials for high class kid. The export of lamb and kid for skins is an interesting development of recent years. In future, India's fur-skins will play a very useful part in international commerce.

The term *tanning* is generally used to cover a variety of processes which convert hides and skins into leather. The principal tanning materials are (*a*) vegetable tanning materials, (*b*) mineral tanning agents, (*c*) oils. Vegetable tanning materials are obtained by water extraction of certain parts of various plants which contain water soluble acid known as tanning or tannic acid. The parts used may be wood, bark, leaves or skin of fruit. Aluminium and chromium are the chief mineral tanning agents. Aluminium is used with fatty matters, such as egg-yolk, olive oil and the gluten of flour. The chromium is used in the form of chromium sulphate. For heavy leather tanning cod, herring, seal or whale oil is used.

During the Second World War the industry received considerable fillip due to large military demands for boots and shoes, harness, saddles and other army equipment. The Uttar Pradesh was the largest producer of army boots and shoes in the British Empire. From the pre-war production of 40 lakh pair of shoes in 1938-39, the country during War produced more than 85 lakh pair of shoes. The output of harness, saddlery etc. can be valued at Rs. 22 crores a year. The output of leather increased by more than seven times. Such a large increase in the supply of leather was made possible by the increased slaughter of cattle to provide meat for the defence forces. The increased slaughter of animals brought in its wake the problem of scarcity of milk supply in urban areas.

The Ship-building Industry*

The necessary requisites for the ship-building industry are:

(*i*) Ship-building and repairing yards,
(*ii*) Deep water in the harbour,
(*iii*) Proximity of raw materials,
(*iv*) Supply of labour.

In Calcutta and Vizagapatam there are already certain repairing yards for making hulls and lighter crafts. Calcutta also boasts of a few dry docks. The Gondawana coalfields are connected by railways with Calcutta and Vizagapatam. Though India is fairly rich in iron ore and there are four important steel manufacturing centres in India which can supply ship-building materials, yet in the initial stage, engines, propellers and other machinery will have to be imported from abroad.

It is interesting to examine the suitability of Vizagapatam as a ship-building centre. The situation of the harbour at the centre of the eastern coast between Calcutta and Madras offers great facilities for bringing down the necessary materials from the hinterland of those two big ports. Vizagapatam has the additional advantage of possessing a deep-water harbour which permits the launching of big ships. The tidal range is also satisfactory. Steel, the most important raw material, can be brought to the shipping yard from Tatanagar, 550 miles away

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* The sea-borne and coastal trade of India is very large and is mostly controlled by foreign companies. The over-sea trade is more than 25 million tons of cargo and a quarter million passengers, and when measured in terms of rupees, it exceeds Rs. 4,000 million. The coastal trade of India is over 7 million tons of cargo and 2 million passenger-traffic. Such a huge trade requires a large mercantile marine. Moreover, India is surrounded by seas on three sides and, therefore, she would have her own ships for the defence of her coasts.

The share of Indian shipping was 2 per cent. in over-sea trade and 25 per cent. in the coastal trade. India possessed in 1949-50 a total tonnage of 350,000 only. The target for 1954 is 2,000,000 tonnage.

PLACE OF INDIAN SHIPPING IN INDIAN PORTS
1949-50

Entered			Cleared		
	Vessels	Freight		Vessels	Freight
Indian	349	238,808	Indian	468	337,750
British	1,268	5,168,948	British	1,015	3,964,505
Others	731	2,118,653	Others	428	1,511,648

by the Eastern Railway. The Gondawana coalfields are also within easy reach. Timber, necessary for making decks, cabins etc., can be had from Chotanagpur. If railway lines are constructed to connect Waltair with the actual ship-yard, the cost of transport in bringing raw materials will be further reduced. The local man-power is cheap and seems to be suitable for modern technic, if properly trained. Thus the Vizagapatam ship-yard may become, in future, a very good ship-building base and may build ships at internationally competitive prices.

The Scindia Steam Navigation Company has recently opened a ship-building yard at Vizagapatam. The building of medium-sized ocean-going vessels has already begun at Vizagapatam. In 1948 one 8,000 tonner was turned out from this yard.

The other major ports of India, like Bombay and Madras, cannot conveniently develop the ship-building industry. Bombay is many hundred miles away from the coal and iron fields. The harbour of Madras is artificial and the sea is shallow. Therefore, big sea-going steamers cannot be launched. The backwater at Cochin provides an excellent harbour and a yard for special repair-work. The most ideal sites near Calcutta are Uluberia and Rajganj because better depths of water are available here. As a ship-building centre, Calcutta has the advantage of being near the source of raw material supply and in the midst of a highly developed mechanical engineering industry.

The great problem of the ship-building industry is the shortage of ship-building plates in the country. Efforts are being made to meet the requirements for new construction of deep-sea-going vessels.

Recently a small ship-building yard project has been launched near *Bhatkal* in Bombay State.

Aircraft Manufacture

The possibilities of an aircraft industry in India are very promising. Apart from the requirements of military aircraft, India, with its long distances and excellent visibility, has vast possibilities of civil aviation.

The Indian Union has now more than 40 air service routes covering about 14,000 route-miles. There are now 16 daily services and 42 weekly services.

In the initial stage of its development, the Government should help the industry to procure machinery and raw materials from abroad and also ensure a certain market by placing substantial orders. In 1939, the Government of India turned down the scheme of the Scindia Steam Navigation Company for the manufacture of aircrafts in India as "impossible". As a result of the changing course of the war, however, the Government declared in 1940 that "it was Government's intention to proceed with the scheme as soon as the necessary plants and materials became available." An aircraft factory was floated in Bangalore in 1941. This factory has now been taken over by the Government and is engaged in the repairing and production of aeroplanes.*

Bangalore, in Mysore State, is an ideal place for aircraft manufacture. The advantages of this centre are the availability of cheap electric power, equable climate, central situation and remoteness from the sea-coast, existence of the Science Institute and the proximity of an iron factory. Jamshedpore is also a potential site for the manufacture of aircrafts.

Automobile Industry

There are fair prospects for the development of an automobile industry in India. The average annual import of motor cars, cycles, omnibuses and parts exceeds Rs. 20 crores. The estimated number of vehicles in use in India is 2,50,000 as compared with 30 million in the U.S.A., 2½ million in the U. K., 2 million in France and 1½ million in Canada.

AVERAGE NUMBER OF PERSONS SERVED BY ONE MOTOR CAR IN SOME COUNTRIES

U.S.A.	4	France	18
Canada	8		
U.K.	18	India	1,900

Recently several companies have floated assembly plants in Calcutta, Bombay, Madras. India has already established seven plants—3 in Bombay, 1 in Madras, 2 in Calcutta and 1 in Okha—for complete assembly of cars and trucks from knocked down condition. *The Calcutta Centre* was started in 1944 by the Hindusthan Motors Ltd. The Company has plants to manufacture complete trucks and motor cars (with the exception of body) and is linked up with Morris Motors, England and 'Studebaker' of U.S.A. for the manufacture of 'Hindusthan' and 'Studebaker' cars in India. A well-equipped factory is being built up at Uttarpara, Calcutta, for assembly work. *The Bombay Centre* was also started in 1944 by Premier Automobiles Ltd. This company is linked with Chrysler Group of U.S.A. and manufactures cars and trucks. During 1947-48, about 22,000 cars and trucks were assembled in the Indian Union. The other sites of the industry may be at Burnpore and Jamshedpore which, besides being near or in the heart of iron areas, can conveniently use imported machines and parts. As these three centres are already noted for engineering industries, the supply of trained labour and various parts for the automobile industry will be available.

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* The name of the company is the Hindusthan Aircraft Factory. The work consists of assemblage of aircraft from imported components and the manufacture from raw materials under an *assistance arrangement* with Messrs. Percival Aircraft Co. of England.

Essentially the automobile industry is a component construction and assembly business. So, India need not produce all the parts and accessories used in building up automobiles. Nowhere in the world an automobile manufacturing plant is self-sufficient in every way. India too while manufacturing most of the parts necessary can import some parts and there need be no qualms about them. The automobile industry of India is likely to manufacture 75 per cent. of the component parts of cars in India itself by 1956. At present only 83 parts are manufactured in India for building automobiles. At present India is importing 20,000 cars and 15,000 trucks annually, causing a drain of about Rs. 20 crores on India's foreign exchange. The existing units in the automobile industry have long-term production plants which when fulfilled will meet the entire demand for cars and trucks.

Lac Industry

The name 'lac' is derived from the sanskrit word "*Laksha*" meaning hundred thousand referring, no doubt, to the innumerable insects that take part in secreting resin.

Lac is virtually a monopoly of India and is grown chiefly in Chotanagpur, Orissa and the Madhya Pradesh. These areas produce about 85 per cent. of the total production, Chotanagpur alone being responsible for 50 per cent. of the total. The annual production of lac is about 1 million cwt. *In its refined form, in which it is usually packed for export, it is known as shellac.*

The insect which produces lac is known as *Laccifer lacca.* It lives as a parasite feeding on the sap-juices of certain trees like Palas, Kusum, Ber, Kahir, Ghont and Arhar.

Lac yields two products—dye and resin. Lac dye trades are no longer important because of the discovery of the aniline dyes. It is now the resin for which lac is important.

Lac is used in a variety of industries. Between thirty and forty per cent. of the total lac is consumed by the gramophone records industry ; another thirty-five per cent. is utilised by the electrical, paint and varnish industries. Lac is also used in sealing-wax manufacture, photographic materials, the confectionery trade, bangles, toys, shoes, dressings, micanite, grinding stones and munitions and fireworks.

About 97 per cent. of the lac produced in India is exported to the United States of America, England, Germany and Japan. America alone takes about 30 per cent. of the total production

EXPORT OF LAC TO FOREIGN COUNTRIES IN CWT.

	1938	1947
U. K.	125,475	154,302
U. S. A.	257,937	254,221
Germany	64,373	...
Holland	36,054	879
Japan	18,729	...
France	11,460	9,105

Although lac is a virtual monopoly of India, its position is by no means secure because of the introduction of synthetic products in foreign countries. Bakelite is now largely used in the electrical trade. In the varnish trade, cellulose preparations are common.

Before the last War, India produced 90 per cent. of the world's supply of lac. The remaining 10 per cent. was produced in Siam, Indo-China and Burma. The refining of raw lac into shellac and seedlac was, however, the sole monopoly of India as the other producing countries sent their raw lac to India for processing.

It is learnt that Siam is now not only producing more lac but is also refining it into shellac for direct export to the U.S.A. and other foreign countries. Against a pre-war average annual export of 5,000 tons of sticklac (mostly to India) from Siam, about 10,000 tons of sticklac and 1,500 tons of shellac were exported from Bangkok during the first nine months of 1947 alone. This is equivalent to about 25 per cent. of India's total production.

There is evidence, too, of improvement in the quality of the Siamese shellac and with all that its price is about two-thirds that of Indian shellac. Shellac factories have been started in Siam for an annual output of 6,000 tons of shellac. This is about one-third of India's production.

The Indian Lac Research Institute was established in 1925 at Namkum near Ranchi with a view to divising improved methods of cultivation, improving the quality of lac, finding new uses for shellac and organising research in consuming countries in co-operation with the industries using lac.

The most deplorable fact about the shellac industry is that no attempt has hitherto been made to utilise it in India on a commercial basis.

Recently the London Shellac Research Bureau (controlled by the Indian Lac Cess Committee) has developed lac-oil varnishes. During 1939-45 the new uses of lac for road paints, anti-gas paints, luminous paint, shellac bitumen, spirit paint, quick-setting cements and rapid drying varnishes for mineral oil and petrol containers were discovered.

The Cement Industry

Cement is a specially prepared material which is used as a binder for stones and brick masonry or as a matrix in the production of concrete. The Indian Cement Industry consists of 18 factories which manufacture natural cement. In 1950-51 the installed capacity was 3·2 million tons, and the actual production was 2·6 million tons. The industry also produces articles manufactured from cement, such as ordinary concrete, reinforced concrete, marble imitations and cement sheets. The cement industry in India enjoys many natural advantages, such as abundant supply of limestone of excellent quality occurring in many parts of the country close to railway lines, suitable clay also close to railway lines, and, the production of gypsum in the country. With regard to fuel, however, the industry labours under a considerable handicap as all the concerns are situated at long distances from the coalfields, and the freight on coal is a very serious item in the cost of production. About 1·6 tons of limestone are required to make 1 ton of cement which contains 4 per cent. gypsum and 38 per cent. coal.

LOCATION OF CEMENT FACTORIES

Areas	No.	Centres
Bihar ..	.. 5	Dalmianagar and Japla, Chaibasa, Khalari (Ranchi).
M. P. ..	.. 3	Jubbalpur.
Madras	.. 4	Madhukarai (Coimbatore), Bezwada, Dalmiapuram (Trichinopoly), Mangalagiri (Krishna).
East Punjab	.. 1	Amritsar.
West Bengal	.. 1	24-Parganas.
Mysore	.. 1	Bangalore.
Hyderabad	.. 1	Hyderabad.
Sourashtra	.. 1	Okhamondal (Porbandar).
Gwalior	.. 1	Gwalior.
U. P.	.. 1	Churk.

The manufacture of cement in India was started as early as 1904 in Madras, although its production was negligible. The first World War gave impetus to the industry, and factories were started at Porbandar (Kathiawar), Katni (Madhya Pradesh) and Rajputana. Since then the industry has progressed very rapidly, and the country has attained self-sufficiency. The cement industry is in a position now to meet the full requirements of the country.*

Year	Imports	Production (in tons)
1937-38	49,100	997,000
1948-49	147,704	1,516,226
1950-51	18,664	2,815,000

With the increase in Indian production of cement, there has been a fall in imports. There is now a duty of Rs. 17-3 per ton on imports. In view of increased production of cement by Indian factories, the Govt. of India decided in August, 1949, to restrict imports to quantities included in Trade Agreement, the total tonnage being about 15,000 tons. There are practically no imports. The Indian cement faces the competition of foreign supplies only in ports. The up-country market, on the other hand, is entirely in the hands of the Indian cement industry.

At present the Indian cement industry is working more or less as a single organisation, and the output and prices are controlled by a merger known as the Associated Cement Companies of India Ltd. India has developed an export trade, and the principal buyers are Iraq, Ceylon and Indonesia.

Match Industry

The Indian match industry owes its development to the protective tariff it enjoys. Before 1921 there was no successful manufacture of matches in India except a very small one in Ahmedabad.† With the imposition of duties on imported matches since 1922, there has been a considerable expansion of the match industry, which enjoys a large home market and cheap labour. In order to avoid the protective import duty, a Swedish Company established factories in India during 1924 and

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* There has been a slight fall in the demand for cement due to the slowing down of several Government projects for financial reasons. There is, however, no overproduction of cement as the *per capita* consumption is still very low. The *per capita* consumption of cement in India is only 16 lbs. compared to 260 lbs. in England and 280 lbs. in America.

† The first match factory which still survives is the Gujerat Islamic Match Factory which was founded in Ahmedabad in 1895.

1925 at Bareilly, Calcutta, Madras and Ambernath. This company (Western India Match Co. Ltd.) has now a virtual monopoly of match production in this country and meets nearly 80 per cent. of the demand.

At present the Indian Union has 107 match factories compared with 6 in Pakistan. The industry employs about 16,000 workers. The match factories are located in Gwalior, Hyderabad, Dhubri (Assam), Kota (M.P.) and Shimoga (in Mysore), Petland (in Baroda), Madras (Tiruvattiyur, 18 miles from Madras), Calcutta and Trivandrum.

PRODUCTION OF MATCHES IN GROSS BOXES OF 50 STICKS

(In 000)

	1946	1947	1948
Wimco ..	18,796	17,247	22,495
Others ..	6,745	10,696	9,500

The expansion of the industry depends upon the adequate supply of suitable type of wood. The Indian match industry consumes over 6 million cubic feet every year. Andaman Island is an important source of wood for the Indian match industry.

FACILITIES OF TRANSPORTATION

The extension of facilities of transportation is the most essential condition for the successful commercial development of a country. A good system of communication by land, water and air is one of the most important of all the requisites for the prosperity of a nation. Transportation permits a country to utilize its economic resources to the best possible advantages. There was practically no organised industry in India till the middle of the nineteenth century due to want of proper facilities of transportation. At present much has been done to develop roads, railways and civil aviation. "Industries have followed transport facilities."

Transportation in India can be divided into four heads, (*i*) railways, (*ii*) roads, (*iii*) waterways, and (*iv*) airways.

Railways

Railways are the most important of all systems of communications. Originally, railways were built up in India for military purposes. The frequent visitation of famine also necessitated the extension of railways. The railways have brought about an equalisation of prices throughout the country. The rapid industrialisation of the country is largely due to railway developments ; it has fostered agricultural production and encouraged the establishment of industries.

The physical and geographical conditions of operation of the railway network in India are most favourable in the Gangetic basin which is an enormous plain of dense population. The mountains in the north and the Western Ghats present considerable difficulties with regard to the construction of railway lines. The Satpura and Vindhya ranges are low, and the railway lines can by-pass the big ranges or cross them by means of tunnels. The Thar desert in Rajasthan with scanty population and resources make railway operation difficult and unprofitable. Thus, in India the railway-route pattern has been very much influenced by the forces of economic geography.

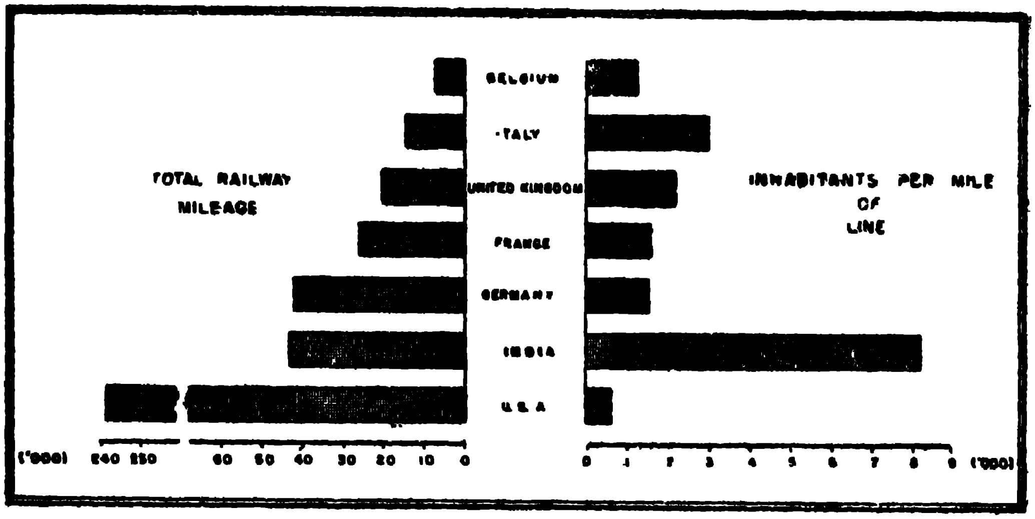

FIG. No. 138.

Before the partition, 43,000 miles of railway lines were open to traffic. The Republic of India has now 34,000 miles of railway lines which operate on three gauges: 5′ 6″, 3′ 3⅜″ and 2′ 6″. The frequent changes of gauge and the scarcity of bridges across some of the bigger rivers are still the main drawbacks of the Indian railway system. To these must be added the absence of railway communication in Kashmir and Nepal.

India requires more railway mileage. In comparison with the U.S.A., Canada and England, India is lagging behind in railway extension.

RAILVAY MILEAGE

Countries	Mileage of total Railways	Mileage of line per 100 sq. miles	Inhabitants per mile of line
India ...	34,000	2·2	7,800
Canada ...	40,351	1·10	222
U.S.A. ...	2,50,000	8·42	450

Indian railways carry annually more than 500 million passengers and 80 million tons of goods.

The present railway lines of India are grouped into six zones:

1. The Northern Railway.
2. The North Eastern Railway.
3. The Eastern Railway.
4. The Western Railway.
5. The Central Railway.
6. The Southern Railway.

Before the regrouping of these railway lines, India had 9 major railway lines and several State Railways. The nine lines were (*i*) East India Railway, (*ii*) Bengal Nagpur Railway, (*iii*) Oudh and Tirhut Railway, (*iv*) Assam Railway, (*v*) South India Railway, (*vi*) Madras and South Maharatta Railway, (*vii*) Bombay-Baroda-Central India Railway, (*viii*) Great Indian Peninsular Railway, and (*ix*) East Punjab Railway.

The formation of these six new railway zones proceeds on the principle of amalgamating small independent lines and well-defined portions of existing railways in contiguous areas into self-sufficient systems, in a compact region having economic unity and natural affinities of trade and flow of traffic.

1. *The Northern Railway* with 5,259 miles serves East Punjab, Pepsu, Delhi, northern and eastern Rajasthan and Uttar Pradesh upto Banaras. Thus, this line consists of the former

East Punjab Railway, Jodhpur Railway, Bikanir Railway and the western section of the East Indian Railway. The headquarters is Delhi. The principal lines which are in broad gauge are :

(*i*) Delhi-Atari via Meerut, Saharanpur, Ambala, Ludhiana, Jullundur and Amritsar. Distance 333 miles. From Amritsar, a line goes to Pathankot for Kashmir.

(*ii*) Delhi-Ferozepur via Bhatinda. Distance 241 miles.

(*iii*) Delhi-Kalka via Ambala. From Kalka a narrow gauge line goes to Simla.

(*iv*) Delhi-Banaras via Aligarh, Kanpur, Allahabad and Moghalsarai. Another line goes from Saharanpur to Banaras via Lucknow and Janghai.

2. *The North Eastern Railway* with more than 6,336 miles of meter-gauge line serves the northern part of Uttar Pradesh, Northern Bihar, northern part of West Bengal and Assam. This line has been formed with the former Oudh and Tirhut Railway and Assam Railway. The head-quarters is at Gorakhpur. The line operates in a well-developed agricultural region and carries large quantities of sugarcane, tobacco, tea and rice. This railway line operates in conjunction with the Ganges in Bihar and the Brahmaputra in Assam and also with motor roads. The principal railway lines are noted below :

(*i*) Gorakhpur-Amingaon in Assam by a new railway line through Siliguri via Chapra, Katihar. The creation of Eastern Pakistan took out the direct railway link between Assam and West Bengal. In 1950 a new line was constructed to connect Katihar with Siliguri. Siliguri was already connected with Madarihat. A new line was laid from here to Fakiragram.

(*ii*) Gorakhpur-Lucknow-Kanpur. Distance 530 miles. A line goes to Bareilly from Lucknow.

(*iii*) Gorakhpur-Banaras via Saran.

(*iv*) Pandu-Gauhati-Tinsukia via Manipur Road. Distance 325 miles. The route follows the Brahmaputra valley. It is to be noted that there is not a single railway bridge over the Brahmaputra.

The line joins the Northern Railway at Kanpur, Lucknow and Banaras.

3. *The Eastern Railway* with more than 5,016 miles of line serves Eastern Gangetic region between Moghalsarai and the Hooghly. West Bengal, Chotanagpur, eastern part of Madhya Pradesh and the Andhra area in Madras. The Eastern Railway consists of a part of former East Indian Railway between Moghalsarai and Calcutta and the Bengal Nagpur Railway. Even in this truncated form, the Eastern Railway handles the largest amount of goods traffic and is one of the most important passenger carriers. Approximately half of .the freight movement on this line is coal followed by iron ore, manganese, jute, mica and other products. As a matter of fact, throughout the Eastern Gangetic plain, this railway line performs highly varied economic services. The tremendous volume of traffic is accounted for by the fact that Calcutta has not only the largest ilndustrial enterprises, but it is also the most important port of the country. The head-quarters is Calcutta.

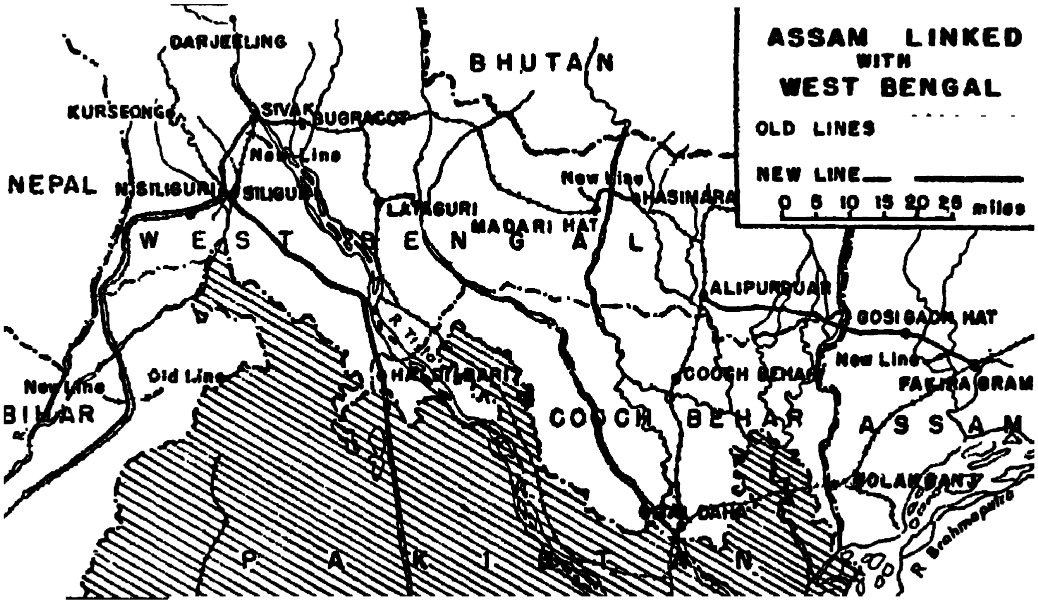

FIG. No. 139

The principal lines are:

(*i*) Howrah-Moghalsarai via Gaya and Dehri-on-Sone.

(*ii*) Howrah-Moghalsarai via Patna. Distance 411 miles.

Both these lines proceed to Delhi, Saharanpur and beyond by the Northern Railway.

(*iii*) Howrah-Kiul via Barharwa, Sahibgunj, Bhagalpur and Jamalpur. Distance 254 miles.

The above mentioned lines are connected with one another by means of several branch lines.

(*iv*) Howrah-Nagpur via Tatanagar, Bilaspur, Raipur. Distance 703 miles.

The Nagpur line crosses the rich mineral areas and handles the substantial portion of the traffic composed of manganese, coal, iron ore etc. Tatanagar—the most important iron and steel centre of India—is on this line. A number of feeder lines has been constructed to connect Tatanagar with the manganese and iron fields of Bonai, Keonjhar and Singhbhum.

(*v*) Howrah-Waltair via Balasore, Cuttack, Berhampur, Vizianagram. Distance 547 miles. This line proceeds to Madras.

There is a very important line which has connected Raipur on the Howrah-Nagpur line with Waltair. The construction of this line has made this section of the Eastern Railway very important. Much of the goods traffic which previously used to be sent to Calcutta for export now passes through Waltair. This section of the Eastern Railway which was previously known as the Bengal Nagpur Railway normally carries 20 million passengers and 18 million tons of goods.

4. *The Western Railway* with more than 5,552 miles of line serves Bombay, Rajasthan, Madhya Bharat and Madhya Pradesh. The line consists of former B.B.C.I. Railway, the Saurashtra Railway, the Rajasthan Railway and the Jaipur Railway. The line serves the great industrial areas of Bombay, Ahmedabad and Baroda and handles tremendous quantities of cotton. After the partition, the congestion of traffic on this line has increased considerably because of the loss of Karachi. This line handles about 10 million tons of goods and 8 million passengers. The head-quarters is Bombay.

Principal lines in broad gauge:

(*i*) Bombay-Delhi via Surat, Baroda, Ratlam, Nagda, Bayana, Bharatpur and Mathura. Distance 861 miles. Bayana is connected with Agra and the latter by a meter gauge with Kanpur.

(*ii*) Bombay-Ahmedabad via Surat and Baroda. Distance 306 miles. Surat is connected with Bhusaval and the latter with Nagpur.

Principal lines in meter gauge:

(*i*) Ahmedabad-Delhi via Abu Road, Beawar, Ajmer, Jaipur and Alwar. Distance 539 miles. Ajmer is connected with Khandwa.

(*ii*) Porbandar-Dhola; Rajkot-Veraval; Kandla-Bhuj; Surendranagar-Okha.

5. *The Central Railway* with more than 5,315 miles of line serves Madhya Bharat, Madhya Pradesh and North-Western part of Madras. The line consists of the former G.I.P. Railway, the Scindhia Railway, Dholpur Railway and the Nizam State Railway.

The principal lines are as follows:

(*i*) Bombay-Delhi via Bhusaval, Khandwa, Itarsi, Bhopal, Jhansi, Agra, Mathura. Mileage 958. Itarsi is connected with Nagpur and Allahabad.

(*ii*) Bombay-Raichur via Poona and Wadi. Mileage 443. The line proceeds to Bangalore.

(*iii*) Delhi-Bezwada via Itarsi, Nagpur, Wardha and Kazipet. The line proceeds to Madras. Kazipet is connected with Hyderabad.

This line handles cotton and manganese of Madhya Pradesh and timber of Bhopal. Normally it carries 50 million passengers and 11 million tons of goods annually. The head-quarters is Bombay.

6. *The Southern Railway* has been formed by the amalgamation of Mysore Railway, the Madras and South Mahratta Railway and the South Indian Railway. Its total length is about 5,724 miles. This railway system has both meter-gauge and broad-gauge lines. It serves the densely populated and fertile areas of Madras, Mysore, Travancore, Cochin and parts of Southern Bombay and Hyderabad. The head-quarters is Madras.

Principal lines in broad gauge:

(*i*) Madras-Waltair via Nellore, Bezwada. Distance 268 miles. The line connects Madras with Calcutta.

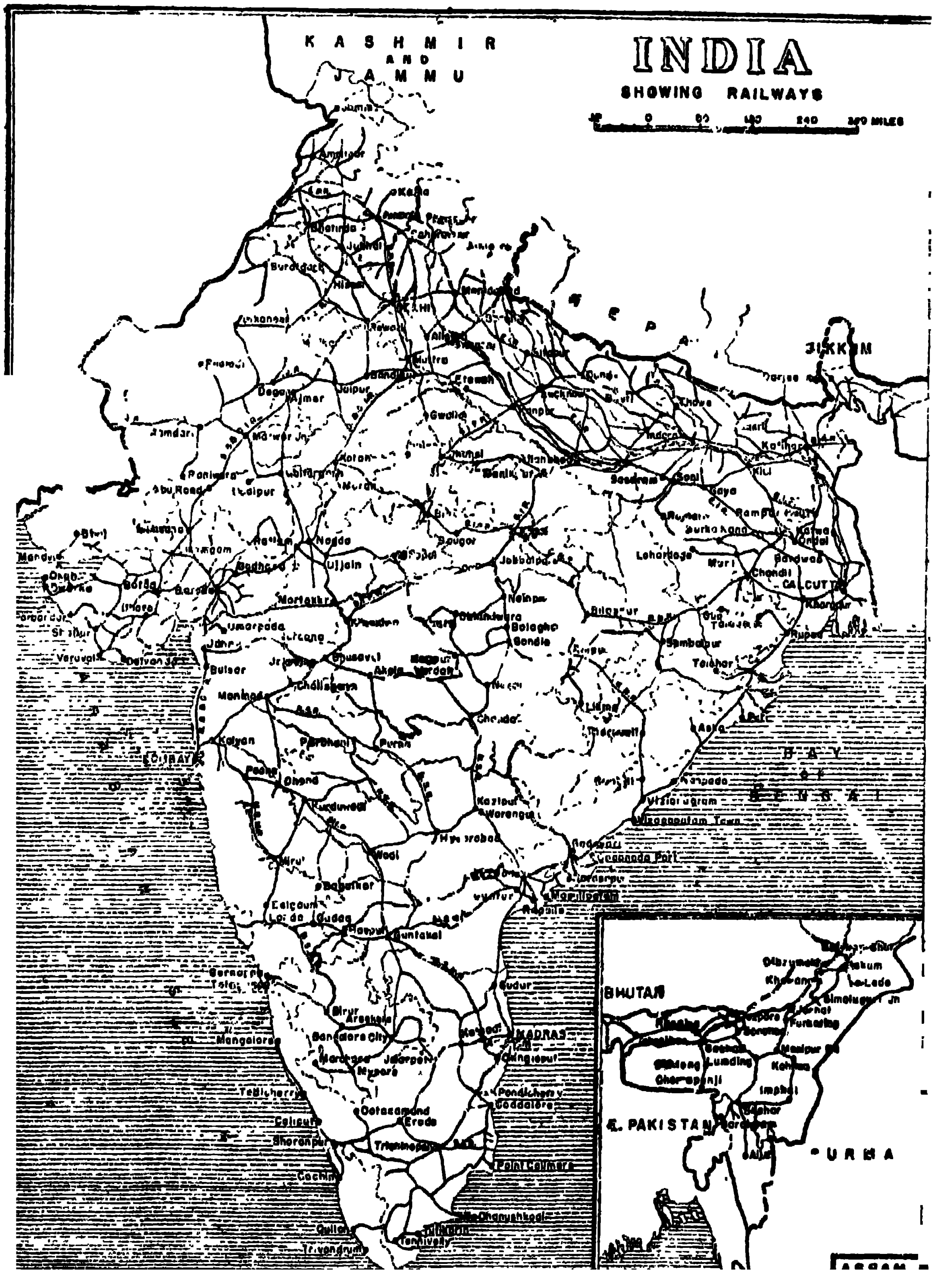

FIG. No. 140.

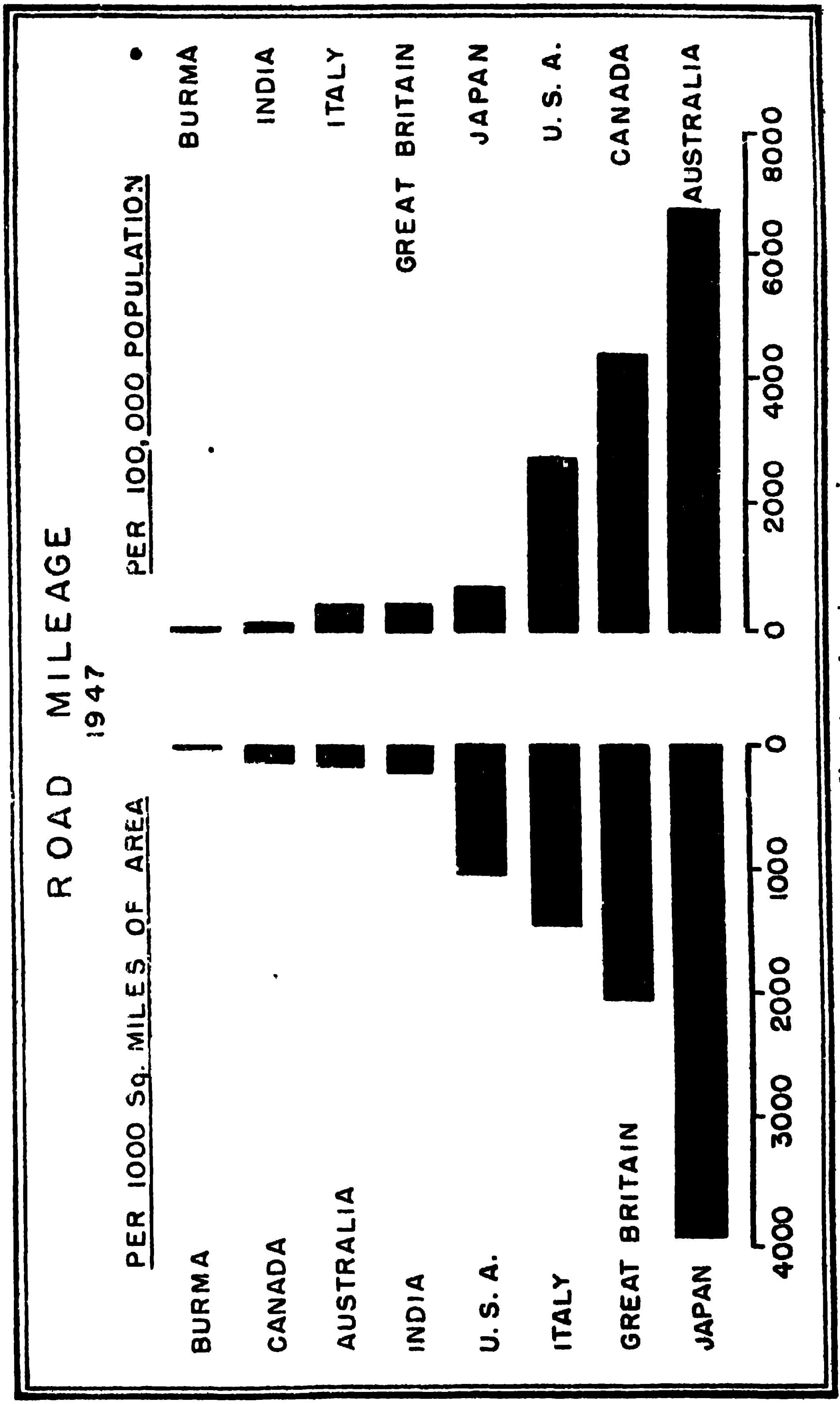

FIG. No. 141. India *vis-a-vis* other countries.

(*ii*) Madras-Raichur via Cuddapa. Distance 351 miles. This line connects Madras with Bombay.

(*iii*) Madras-Bangalore. Distance 222 miles.

(*iv*) Jalarpet-Mangalore via Salem, Erode, Coimbatore, Tellicherry. Distance 423 miles. Jalarpet is connected with Bangalore and Ootacamund.

Principal lines in meter gauge:

(*i*) Poona-Harihar. Distance 415 miles. This is an alternative route to Bombay from Madras. The line goes to Bangalore from Harihar.

(*ii*) Guntakal-Masulipatam via Bezwada. Distance 320 miles.

(*iii*) Madras-Dhanuskodi via Tanjore and Trichinopoly. Distance 422 miles.

(*iv*) Madras-Trivandrum via Trichinopoly, Virudhanagar, Madura and Quilon. Distance 512 miles. From Virudhanagar a line goes to Tuticorin.

The lines lead to several ports like Madras, Cochin, Tuticorin, Alleppey, Quilon and Calicut. Grain, cotton, oilseeds, salt, sugar, tobacco, timber and hides are the chief commodities handled.

Road Transport

Indian Union has about 250,000 miles of roads. Considering the size of the country this mileage is very meagre. Of the total roads, 67,000 miles only are hard-surfaced. Want of adequate roads is keenly felt in rural areas. The introduction of motor vehicles has resulted in the greater construction of good roads and their improvements. In many parts of India motor transport today serves as the chief means of communication. Widespread road construction has been carried out in the Uttar Pradesh, Kashmir, Madhya Bharat and Travancore. In several states, the motor transport is run by the Governments. The important road centres are Delhi, Calcutta, Agra, Allahabad, Nagpur, Hyderabad, Madura, Trivandrum and Indore from which highways radiate in many directions. Good road communication in a vast country like India, which is predominantly agricultural, is essential. Railways have served their purpose with credit and it is now felt that to help the country to continue the development of its potential wealth, roads must be opened and improved—not to supplant the railways in moving goods and people over long distances, but to provide a properly co-ordinated supplement to railway transportation.

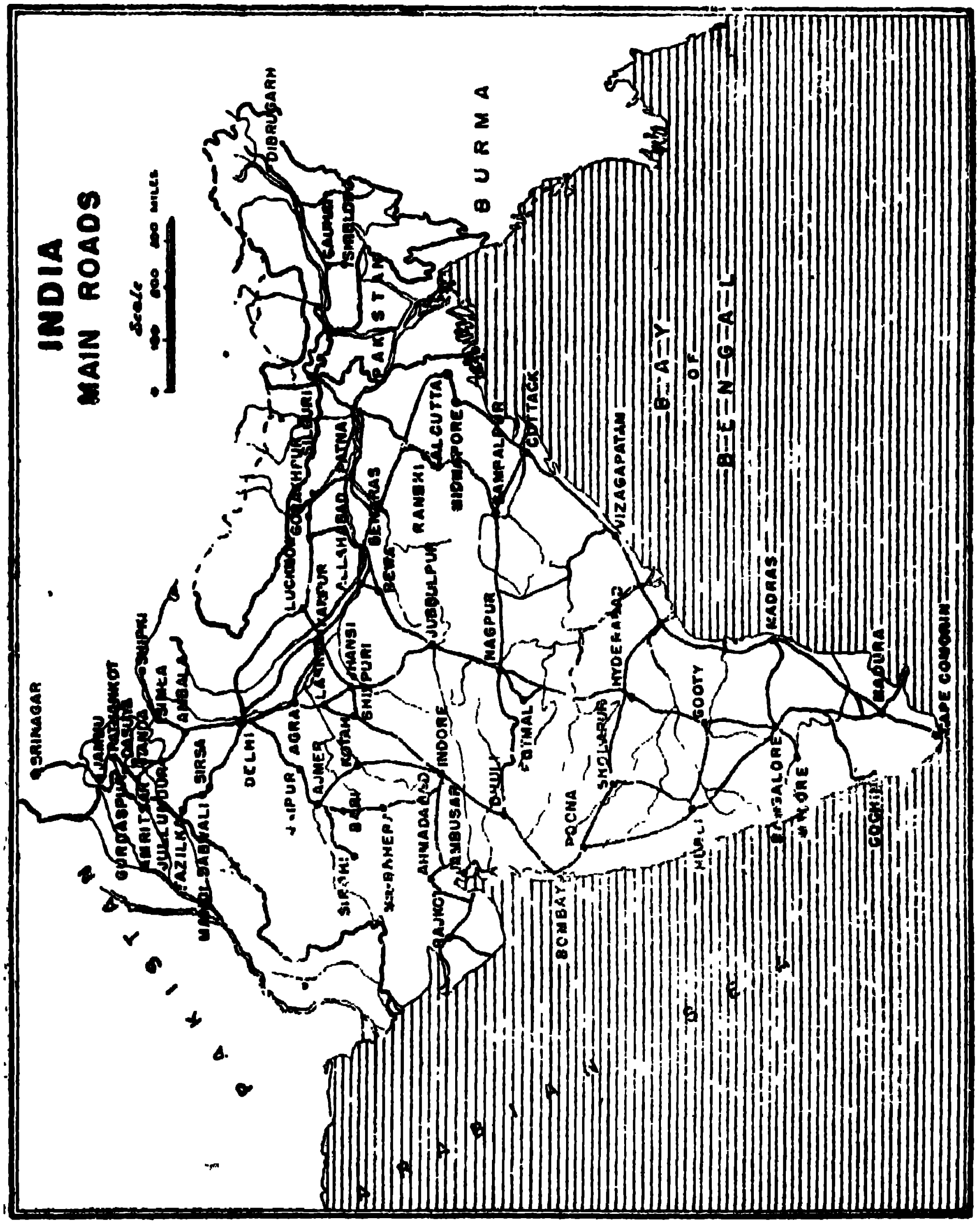

FIG. No. 142.

ROAD MILEAGE IN THE DIFFERENT STATES OF INDIA

Madras	27,115 miles	M. P.	7,535 miles
Bombay	13,400 ,,	Bihar & Orissa	3,961 ,,
Punjab (I)	7,000 ,,	West Bengal	3,000 ,,
U. P.	7,776 ,,		

About 40 per cent. of railway mileage is paralleled by metalled roads. Buses and lorries carry goods and persons from rural areas to towns and railway stations. Motor transport has become an indispensable agency for short-distance traffic as it affords quick, cheap and flexible service. It cannot be denied that in many cases railways consider the public buses and lorries as competitors. Road transport is cheaper than railways, because it does not require stations, sidings etc., and as such, it can offer low rates. In the neighbourhood of large cities and suburbs and in areas where roads run parallel to railways, competition is confined to short distances only, *viz.*, a range of 50 miles.

There are at present four trunk roads with which subsidiary roads are linked:

(1) Calcutta to Delhi.
(2) Calcutta to Madras.
(3) Madras to Bombay.
(4) Bombay to Delhi.

These trunk roads comprise 5,000 miles of metalled roads.

The roads are great feeders of railways. They link up the cultivators' holdings with the local markets and the nearest railway stations. Without good and sufficient roads railways cannot collect for transport enough produce to render their operation possible. To avoid competition, roads and railways should be extended in such a manner that roads may become the feeders of railways and not their competitors.

The Frontier Routes

Although India has an extensive land frontier more than 3,000 miles long, the volume of trade is very small. Dense forests, high mountains and deserts have so long hindered the progress of land frontier trade. There is no through railway line from India to her frontier countries. Yaks, mules, camels and ponies are usually employed in maintaining trade relations with Central Asia, Tibet and Nepal.

There is a route which goes from Leh in Kashmir to Tibet and Sinkiang. This is one of the hardest routes in the world, as it includes the Karakoram Pass (18,000 ft.).

Communications with Tibet are maintained through Darjeeling, Nainital and Bettiah.

From Ledo in North-East Assam the route which runs to China through Burma assumed great importance during the Second World War. This route is known as the Stilwell Road (formerly the Ledo-Burma Road). From Ledo, the route proceeds towards the south and reaches Bhamo *via* Myitkyina. A separate road also reaches Bhamo from Lashio. From Bhamo the route goes towards the east and after traversing a series of high mountains reaches Kunming *via* Paoshan. The distance between Ledo and Kunming is 1,044 miles. The same road continues for another thousand miles to reach Chungking. The Stilwell Road may help the development of Indo-China trade.

A considerable trade passes between India and Pakistan through land frontiers.

Waterways

From the earliest times the trade and commerce of Northern India have been much facilitated by the abundance of navigable streams and the flat relief of the region. The combined mileage of the navigable rivers in Northern India is about 20,000. Before the advent of the railways, the rivers of Northern India handled a considerable portion of the country's inland trade. But inland navigation received a great set-back with the development of railways. Today, inland water transport in India is of minor importance, its goods traffic in terms of ton-kilometers being only one per cent. of that of the railways.

The river traffic of India can be made very important in the transport system as such traffic possesses a tremendous freight capacity.

The great disadvantage of the rivers of India is that they usually enter the sea in shallow, sandy delta-mouths, instead of broad and deep estuaries, which, in other countries, offer a pathway for ships and commerce far into the interior.

Besides a large number of minor streams, India has two great rivers which serve, even to-day, as arteries of trade and travel. These are the Ganges and the Brahmaputra and they carry the largest part of the river traffic.

The **Ganges** is the most important river of India. The source of the Ganges is an immense mass of snow at 14,000 feet up on the Himalayan range in the Garhwal district. The river is 1,600 miles long. From Hardwar at the foot of the Himalayas, the Ganges flows in a south-easterly direction through the rich alluvial plains of the U. P., Bihar and Bengal into the Bay of Bengal. For about 500 miles from its mouth, the river

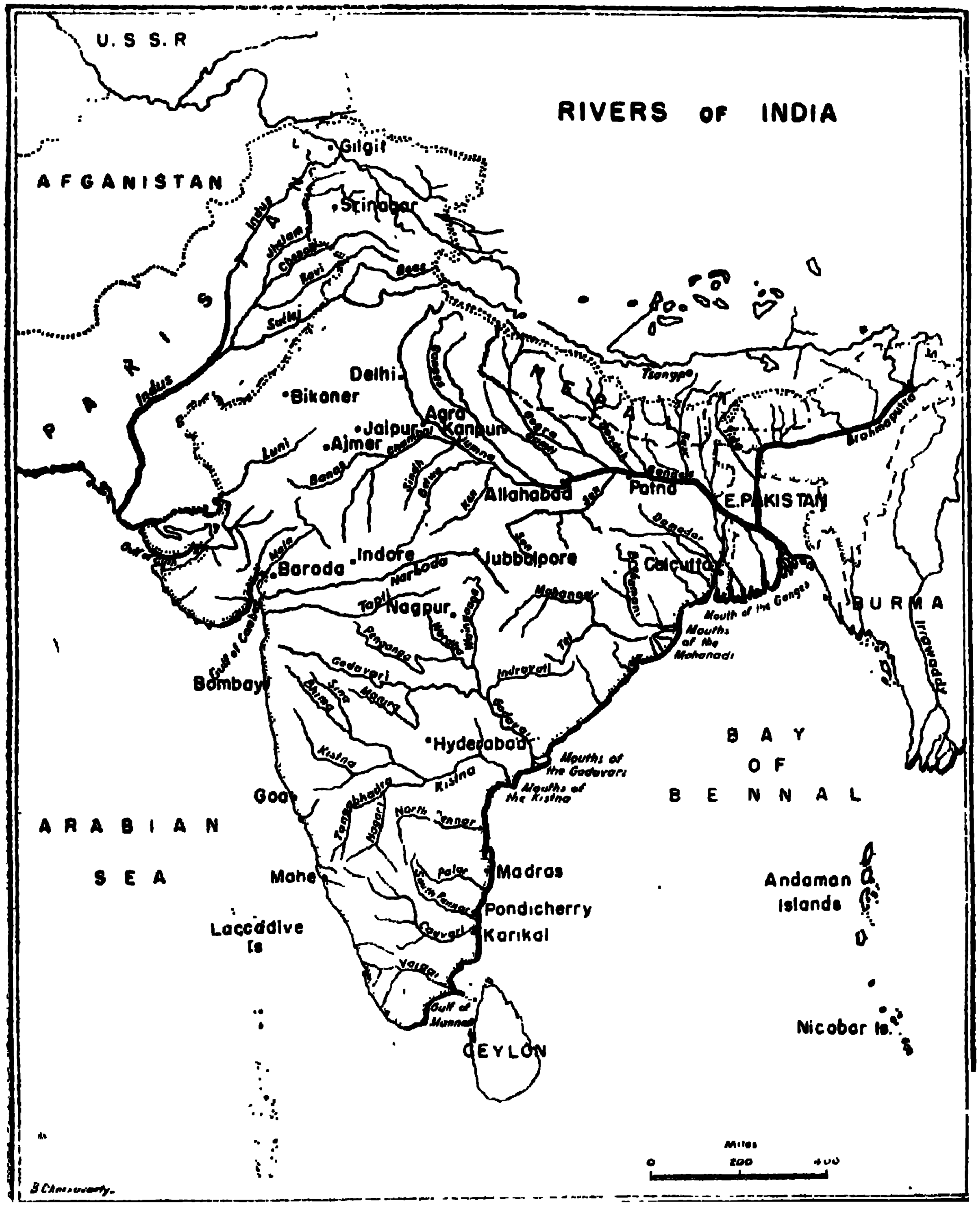

FIG. No. 143.

maintains a nearly uniform depth of about 30 feet, and, therefore, steamers can safely move up to that distance, although country boats proceed as far as Hardwar. "The navigation in the Ganges is quite magnificent and offers probably one of the finest spectacles of its kind to be seen in the world." The Ganges has lost much of its importance as a highway of commerce because of the development of the railways. On the Ganges, steamers used to ply as far up as Gurmukteswar about 400 miles above Allahabad even as late as 1854. The river is now navigable up to Buxar (near Patna). There is a plan to make it navigable upto Allahabad.

The tributaries of the Ganges are mostly on its left bank, and these are the *Gumti, Gogra* and *Gandak*. Scanty rainfall and the absence of any snow-capped mountain in central India account for a small number of tributaries on the right bank of the Ganges. The *Jumna* is a great tributary of the Ganges and runs parallel to it for 860 miles and joins the Ganges at Allahabad.

The important towns on the Ganges are Hardwar, Kanpur, Allahabad, Mirzapore, Banaras, Ghazipur, Patna, Monghyr, Murshidabad and Calcutta, while on the Jumna the chief towns are Delhi, Mathura and Agra.

4. **The Ganga Barrage Project.** About 400 years ago, the Bhagirathi, which is now only a channel, was the main stream of the Ganges in its last stage. Subsequently, however, because of violent floods or some subterranean upheaval, the Ganges took an easterly turn and joined the Brahmaputra at Goalundo in Faridpur district of East Pakistan.

Since then the Bhagirathi has much deteriorated as a waterway. Meanwhile the Damodar river which is an important tributary of the Bhagirathi, has moved its mouth 70 miles further down. These changes have resulted in the silting up of the Bhagirathi. Thus, today it is only a seasonal river. Even its lower course which is known as the Hooghly is subject to the actions of the tides which are responsible for silting up quite a large part of the river.

Owing to the diminished quantity of water which comes from the Ganges and also because of the tides, the water of the Hooghly river gets a saline character. This is a serious problem affecting the supply of drinking water to Calcutta.

Then again with the deterioration of the Bhagirathi, there is no proper water transport to connect Calcutta with Northern India. It is possible to have a through water communication between Calcutta and the Gangetic plain through Bhagirathi.

The present state of the Bhagirathi is also responsible for affecting the condition of Calcutta as a port because it is now becoming dangerous for steamers to move up the Hooghly.

It has been proposed to construct a barrage on the Ganges near Rajmahal which is about 24 miles below Sahibgunj in Bihar. The construction of the barrage will divert a portion of the Ganges water to the Bhagirathi by means of a canal.

The Ganga Barrage Project has the following objectives:

1. Construction of the Barrage across the Ganga in the border of Bengal-Bihar. (The final site has not yet been selected) It is selected. The place is Farakk
2. The provision for a greater volume of water in the Bhagirathi and other rivers of West Bengal.
3. The navigable route between Calcutta and the Ganges.
4. The conservation of the river Hooghly for the benefit of Calcutta by bringing down sufficient head water.

Thus, with the completion of the project the river Bhagirathi will become navigable throughout the year. The salinity of the river Hooghly will also be reduced by the continuous flow of water of the Bhagirathi. The problem of Calcutta Por

The **Brahmaputra** is one of the longest rivers in the world. It is about 1,800 miles long. It has its source at a height of nearly 16,000 feet, a little east of Lake Manasarowar in Tibet. Flowing eastwards along the foot of the northern slopes of the Himalayas, it enters Assam and takes a sharp bend towards the south-west. After traversing the entire length of the Assam valley, the Brahmaputra again bends towards the south and joins the Ganges at the south-eastern corner of the Pabna district in Eastern Pakistan.

The Brahmaputra is important for carrying Assam oil, tea, timber and jute which are brought to Calcutta by having them transferred to rail and road system on the border of Pakistan.

The river is navigable by steamers throughout the year and steamers run from the mouth to Dibrugarh, about 800 miles from the sea. There are certain drawbacks in the river which make navigation dangerous: (*a*) formation of new islands, sand banks and shoals, and (*b*) the presence of a very strong current during the rains. The rich deposits of silt as the result of floods every year make agriculture very productive in the Brahmaputra basin. In agricultural and commercial utility, the Brahmaputra ranks next to the Ganges.

The principal rivers of the Peninsular India are the *Narmada, Tapti, Mahanadi, Krishna* and *Kaveri*. Of these, the Narmada and the Tapti flow towards the west coast. Owing to the greater heights of the Western Ghats, the other rivers flow towards the east. These rivers are navigable in their lower courses only during the rainy season.

There are only a few navigable canals in India, the most notable being (*i*) the Circular and Eastern Canals in Bengal, (*ii*) the Ganges Canal running from Hardwar to Kanpur extending over 275 miles, (*iii*) the Buckingham Canal running parallel to the east coast in Madras over a distance of 260 miles and (*iv*) the Orissa Coast Canal.

In the Godavari and Krishna Deltas the navigable canals are the main highways. The back waters are also important on the west coast between Cochin and Quilon as waterways.

The need for waterways in India is great. In spite of physical difficulties, much improvement can be made in the existing waterways of the country. Its development would not only remove the congestion of traffic from railways, but would also open up many new areas whose products cannot be at present moved because of high railway freights.

The Economic Commission for Asia and the Far East sent an expert to India in February, 1950, to investigate the possibilities of developing traffic on waterways in (*i*) the Ganga from Buxar to Allahabad, (*ii*) Gogra upto Bahramghat, (*iii*) Tapti upto Aorakpur, (*iv*) Bhagirathi, (*v*) Mahanadi and Orissa Coast Canal, (*vi*) Buckingham Canal, and (*vii*) Tapti upto Kakvapa and 50 miles above. The report is under consideration of the Government.

The Sea Routes

The sea-routes radiate mainly from the five major ports of Calcutta, Vizagapatam, Madras, Bombay and Cochin. The principal sea-routes of India are the Suez route, the Cape route, the Australian route and the Singapore route. *The opening of the Suez route* has increased the volume of trade between India and Europe. The B. I. S. N. and P. & O. Companies control this route so far as the trade relation of India and Europe is concerned. India sends raw materials and food-products and receives in return manufactured articles.

The Cape route connects India with South Africa and parts of West Africa. Sometimes steamers proceed along this route from India to South America. The imports coming into India by this route are cotton, coal and sugar.

The Singapore route is second to the Suez route in respect of volume of traffic. This route connects India with China and Japan. The route also maintains India's trade relation with Canada and New Zealand. The important steamship companies which used to serve this route during pre-war days were the Indo-China S. N. Co. Ltd., the N. Y. Kaisa and O. S. Kaisa.

The imports coming into India through this route are cotton and silk manufactures, iron and steel, machinery, porcelain, toys, chemicals, paper, hardwares, etc. The exports from India are raw cotton, pig iron, manganese, jute, shellac, mica etc.

The Australian route is gradually becoming important. It connects India with Australia. The imports coming into India are wheat, raw wool, horses, canned fruits, provisions etc. The exports from India are jute, tea and linseed. The chief ports of Australia engaged in maintaining trade relations with India are Brisbane, Sydney and Melbourne.

In the *sea-borne trade,* Indian vessels have practically no place as carriers. Of the total trade it controls only 2 p.c. It is equally pitiable in coastal trade, where Indian vessels control about 20 p.c. of the total. The Indian shipping companies find it difficult to start operations because of the keen competition. The British, the French, the Japanese and the Italians controlled a large share of our sea-borne trade—coastal as well as oceanic—before the Second World War.

Development of Air Transport

Indian Union has become a vital force in modern air age, having acquired the fourth place in civil aviation among the nations of the world.

The speedy advancement of civil aviation in India is regarded as having no parallel in the world.

Indian Union has three big airports at Bombay (Santa-Cruz), Calcutta (Dum Dum) and Delhi (Palam), maintained on international standards, seven major aerodromes at Ahmedabad, Allahabad, Lucknow, Madras, Nagpur, Patna and Vizagapatam, 13 intermediate aerodromes and 22 minor aerodromes. Besides these, there are 26 aerodromes in the states union. The Government of India propose to construct in the immediate future new civil aerodromes in 14 places, namely, Ajmer, Aligarh, Berhampur, Calicut, Cuddalore, Dehra Dun, Hubli, Mangalore, Nellore, Ootacamund, Salem, Ratnagiri, Saugor and Surat.

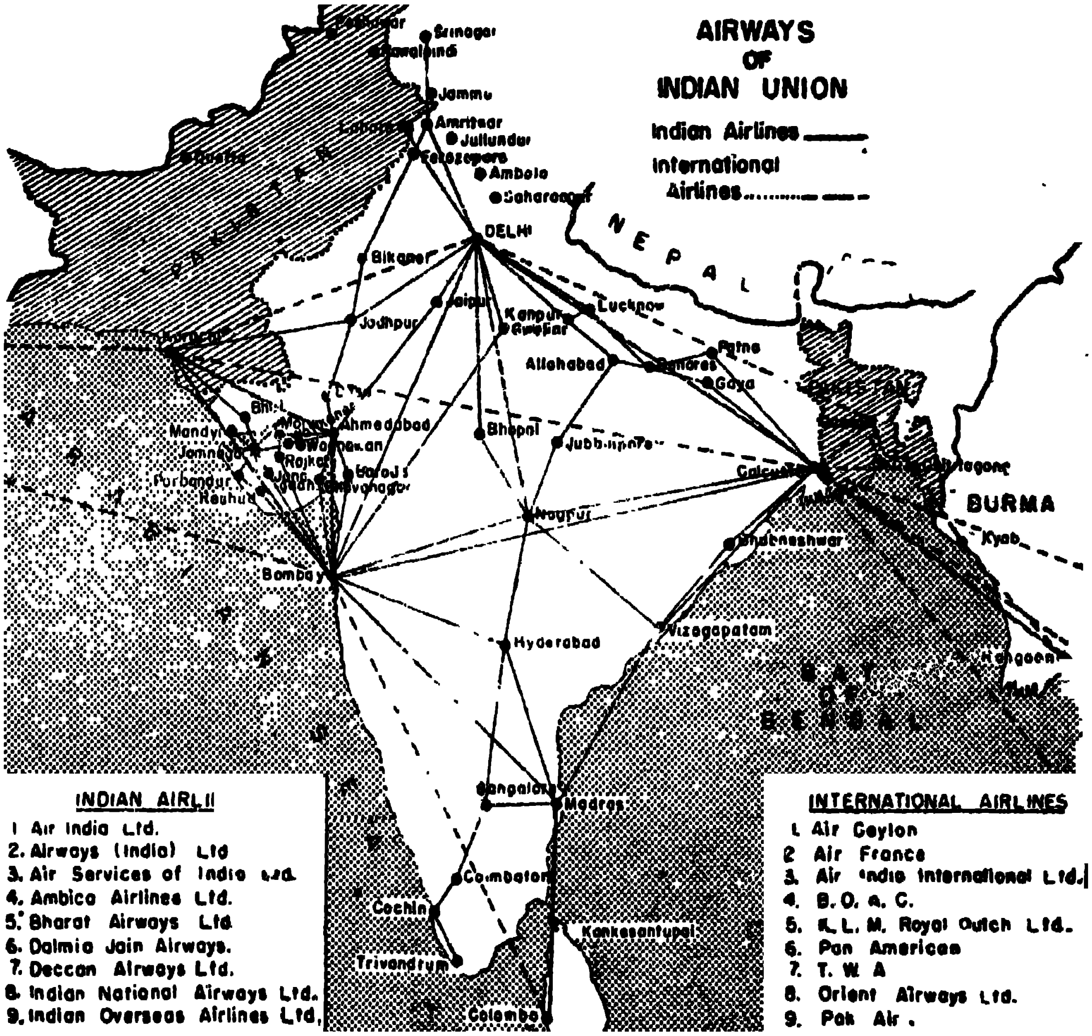

FIG. No. 144. Note the different lines meeting Calcutta, Bombay and Delhi. The Dalmia and the Ambica airlines do not exist now.

There are three types of air transport routes in India: (*a*) trans-continental trunk routes, (*b*) regional trunk routes, and (*c*) local service routes. A typical trans-continental route is one which connects Bombay with Calcutta and is linked up with foreign and overseas air routes at Bombay and Calcutta. The regional trunk routes connect foreign and overseas routes at Bangalore, Delhi, Hyderabad, Nagpur etc. The local service routes feed regional and trans-continental routes, such as the Trivandrum-Madras line or Gauhati-Calcutta line or Delhi-Srinagar line.

Compared with U. S. A. and U. K. the progress of civil aviation in India is modest.

The progress of civil aviation in the Indian Republic can be judged from the following facts and figures:

	1946	1951
Miles flown	4·5 million	19·5 million
Passengers carried ...	105,200	449,500
Mails carried	1 million lbs.	7 million lbs.
Freight carried	1·3 million lbs.	83·2 million lbs.
Total Load ton-miles ...	6,391,000	39,015,000
Capacity ton-miles ...	8·5 million	57·4 million
Load factors	74·8 p.c.	68·0 p.c.

It should be noted that the general economic conditions of the country influence the growth and development of civil aviation. In future, therefore, further extension of air traffic will depend on the rate of economic progress. The two other factors affecting the expansion are the high cost of aviation petrol which is a vital element in the cost of operation, and the small number of industrial and business centres as compared to the size of the country.

The most important feature in the aviation of India is the *night air mail services* in Delhi, Bombay, Calcutta and Madras. *Nagpur* is the meeting place for the exchange of mails. A certain number of passengers are also taken in the air mail service.

Many of India's internal airlines are now running at a financial loss. One of the reasons is that there are too many companies flying India's air-routes. There is in some cases actual duplication. Another reason is that even now night flying has not become common so that in addition to their short day-time usage aircrafts are grounded for almost half of each 24 hours.

The Government of India is subsidising this industry by allowing rebate in aviation petrol. It is estimated that the total relief in 1949-50 amounted to nearly Rs. 49 lakhs. The principle of subsidy to scheduled operators has been accepted by the Government and assistance in the form of loan for the purchase of aircraft is also promised.

CIVIL AVIATION IN INDIAN UNION

	Routes	Miles	Frequency
1.	*Air India Ltd.*		
	Bombay—Madras—Colombo	1780	daily
	Bombay—Ahmedabad—Jaipur—Delhi	750	,,
	Bombay—Calcutta	1038	,,
	Madras—Bangalore—Coimbatore—Cochin—Trivandrum	509	,,
	Bombay—Delhi		Night service
	Bombay—Karachi		daily
2.	*Indian National Airmays Ltd.*		
	Delhi—Lahore	264	,,
	Delhi—Amritsar—Srinagar	245	,,
	Delhi—Calcutta	812	,,
	Delhi—Jodhpur—Karachi	683	,,
	Calcutta—Rangoon		,,
	Calcutta—Katmandu—Patna		3 weekly
3.	*Air Service of India Ltd.*		
	Bombay—Porbandar—Jamnagar—Bhuj—Karachi	620	2 weekly
	Jamnagar—Ahmedabad	162	1 weekly
	Bombay—Bhavnagar—Rajkot	210	daily
	Bombay—Gwalior—Kanpur	774	2 weekly
	Bombay—Poona—Bangalore		2 weekly
	Bombay—Belgaum—Cochin		3 weekly
4.	*Deccan Airways Ltd.*		
	Delhi—Nagpur—Hyderabad—Madras	1155	daily
	Hyderabad—Bangalore	316	4 weekly
	Hyderabad—Bombay	387	daily

CIVIL AVIATION IN INDIAN UNION—*Contd.*

Routes	Miles	Frequency
5. *Indian Overseas Air Lines Ltd.*		
Bombay—Nagpur—Calcutta ...	1038	daily
6. *Airways Ltd.*		
Calcutta—Vizagapatam—Madras—Bangalore	1036	4 weekly
Calcutta—Dibrugarh		3 weekly
Calcutta—Bagdogra (For Darjeeling)		daily
Calcutta—Nagpur—Bombay ...		,,
7. *Bharat Airways Ltd.*		
Calcutta—Chittagong		daily
Delhi—Lucknow—Calcutta ...	809	3 weekly
Delhi—Kanpur—Calcutta ...	819	4 weekly
Calcutta—Gauhati—Tezpur ...		daily
Calcutta—Silchar		,,

Besides these internal services, Indian companies maintain overseas services with the United Kingdom, Burma, China, and Japan.

Several foreign airlines have air service in the Indian Union. These foreign lines are the following :

I. British Overseas Air Corporation (B. O. A. C.)—London-Calcutta via Malta, Cairo, Basra, Karachi and Delhi.
II. Trans-World Airline (T. W. A.)—Washington-Bombay.
III. Air France—Paris-Saigon via Cairo, Karachi and Calcutta.
IV. Dutch Airline (K. L. M.)—Karachi-Calcutta-Singapore-Batavia.
V. Pan-American World Airways—Calcutta to New York via Karachi, London, Gander ; Calcutta-San Francisco via Bangkok, Manila and Honululu.
VI. Scandinavian Airways.
VII. Ceylon Airways.
VIII. China-National Airways.

IX. Iran-Airways—Bombay—Teheran.
X. Pak-Airways.
XI. Orient Airways.

There is also air service between Indian Union and Pakistan. The chief routes are (*a*) Karachi-Delhi ; (*b*) Karachi-Bombay ; (*c*) Dacca-Calcutta ; (*d*) Calcutta-Chittagong ; (*e*) Dacca-Delhi.

FOREIGN TRADE

Foreign trade is important for several reasons. First, it enables a country to sell its surplus goods to foreign countries at an advantage ; second, it can obtain goods and machinery which it does not produce itself but requires for internal economic development ; and third, in liquidating international obligations, if any, every country must participate in foreign trade to a more or less extent. Another special advantage of foreign trade is that it brings about a better understanding among peoples who have to come into mutual contact in the process of trade.

The foreign trade of India is fairly large. The Indian Republic occupies a very important position in international trade. In peace time, the country ranks fifth among the trading nations being exceeded only by the U.S.A., U.K., Germany and France. The causes of India's importance in foreign trade generally lie in the nature of her geographic resources and location. Her resources are very great in certain directions. She is the main supplier of ilmenite, mica, monazite, zircon, and jute goods in the world ; she has large exportable surplus in iron ore, manganese ore, oilseeds, tea and cotton goods. On the other hand, she produces at present less than her consumption requirements of such important products as machinery, petroleum, vehicles, metals, chemicals, long-stapled raw cotton, raw jute and grains.

Certain characteristics are noticeable in the matter of the foreign trade of the Indian Republic.

(*a*) *In the composition of India's foreign trade, the share of imports of raw materials is on the increase while the share of exports of raw materials to total exports is on the decline after partition.* Although this change was noticeable during the World War II, it has been accelerated in the post-war years by partition. On the one hand the Indian Republic has lost many of her raw material resources as a result of partition and, on the other, her relatively improved industrial position now necessitates a large domestic utilisation of her raw materials. On the export side, India has lost heavily in jute (from 718,000 tons in pre-war years to 214,000 tons in 1948), raw cotton (from 485,000 tons to 76,000 tons in 1948), oil-seeds, shellac, hides and skins, tobacco and spices. Thus, in 1938-39, exports of raw materials accounted for 45 per cent. of India's exports, while in 1950-51, it was only 23·4 per cent. of the Indian Republic's total exports. On the import side, India imported raw materials in 1938-39 to the extent of 22·7 per cent. of her total imports, whereas in 1950-51, her import of raw materials was 35·1 per cent. of total imports. This change involving a relative decline in the exports of raw materials and a relative increase in their imports is likely to become a long-term feature of our foreign trade ; and with the increase of population, and increasing urbanisation, this tendency will be accelerated in the future.

(*b*) *In the composition of India's foreign trade the imports of manufactured articles are steadily declining and the exports of such goods are on the increase.* The manufactured articles accounted for 45·6 per cent. of India's total imports in 1950-51 as against 61·6 per cent. in pre-war years. Again, the exports of manufactured goods from India accounted for 53·5 per cent. of total exports in 1950-51 as against 30 per cent. in pre-war years. "This change is partly due to India's policy of encouraging exports of manufactured articles and partly due to a relative improvement in the industrial position of India."

COMPOSITION OF EXPORTS AND IMPORTS

(*In percentage of total*)

	Imports		Exports	
	1937-38	1948-49	1937-38	1948-49
Food, Drink, Tobacco ...	14·1	24·3	23·3	21·2
Raw materials ...	22·7	30·7	45·0	23·4
Articles manufactured ...	...	...	29·9	53·5
(*a*) Machinery ...	11·6	12·1	...	...
(*b*) Others ...	50·0	32·2	...	...
Other articles ...	1·6	0·7	1·7	1·9
	100	100	100	100

(*c*) Before the partition the bulk of foreign trade was with the United Kingdom and her Dominions because of Imperial Preference. As a rule, the U. K. and her Dominions sold more to India than what they bought from India. On the other hand, other countries in Europe, America or Asia, took more of our exports than we imported from them.

(*d*) *Another characteristic of the direction of India's foreign trade is the steady increase in her trade with the U.S.A., Australia and other Far Eastern countries.* Pakistan occupies an important place in India's foreign trade. In 1948-49, Pakistan was the third most important source of imports and the second most important destination of India's exports.

GEOGRAPHICAL DISTRIBUTION OF INDIA'S TRADE

SOURCES OF IMPORTS (in p.c.)	1938-39	1948-49	DESTINATION OF EXPORTS (in p.c.)	1938-39	1948-49
United Kingdom	30·2	22·9	United Kingdom	34·1	21·7
Pakistan ..	...	17·1	Pakistan ..	...	16·4
Egypt ..	1·6	5·4	U.S.A. ..	9·1	15·7
Burma	15·4	5·3	Australia ..	1·7	4·7
Australia ..	1·3	5·1	Argentina ..	1·6	3·8
Iran	1·9	3·0	Burma ..	6·3	2·4
Italy	1·6	2·7	Canada ..	1·2	1·8
Argentina ..	...	2·4	Egypt	0·8	1·7
Canada	0·6	1·5	France ..	3·2	1·5

(*e*) The fourth feature of the foreign trade of India is the extremely small proportion of its *land trade.* With the growth of communications, this trade with China, Russia, Pakistan, Burma etc., will develop further. At present about 98 per cent. of our foreign trade is sea-borne.

(*f*) The difference between the value of export and import is known as the *balance of trade.* When India's exports exceed her imports, the balance is said to be in India's favour. Before the partition, an excess of export was always noticeable in India's trade figures. *After the partition,* the traditional surplus trade balance has now become adverse.

India's total foreign trade in 1950-51 (sea and air-borne and land-borne) amounted to Rs. 1204·44 crores as compared with Rs. 1106·26 crores during 1949-50, and Rs. 1126·66 crores during

1948-49. Imports into India during 1950-51 amounted to Rs. 607·88 crores and exports from India to Rs. 592·01 crores.

There was thus a considerable improvement in the balance of trade position ; the deficit balance in 1950-51 being Rs. 11·32 crores as against Rs. 94·48 crores in 1949-50 and Rs. 219·26 crores in 1948-49. This decline in the adverse trade balance in 1950-51 as compared with the preceding two years was due mainly to a large increase in exports of cotton manufactures, oils, tea, gums, resin and lac, raw wool and manufactures, tobacco and fruits and vegetables.

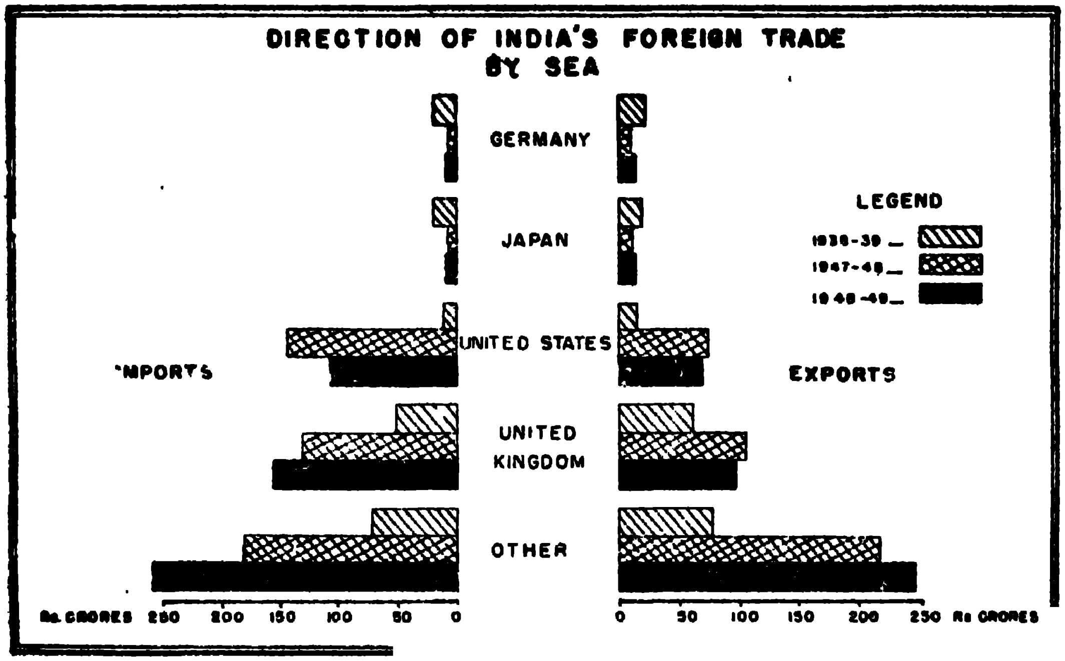

Fig. No. 145.

The spectacular increase in exports was obviously attributable to devaluation and the buoyancy in foreign markets caused by the U.S. and European rearmament programmes.

The Government's relatively restricted import policy and the non-availability of importable goods at reasonable prices also accounted for the improvement in the balance of payments position. The inflation in the prices of foreign goods, subsequent to the outbreak of the Korean war, resulted in a reduction in the quantum of imports, but an increase in their total value.

There was a gradual decline in imports into India by sea from 1948-49 to 1950-51. From Rs. 587·96 crores during 1948-49 sea-borne imports fell to Rs. 565·61 crores during 1951.

The chief articles imported into India by sea during 1950-51 were raw cotton and waste (Rs. 100·76 crores) ; Machinery of all kinds (Rs. 84·39 crores) ; Grain, pulse and flour (Rs. 80·26 crores) ; Oils (Rs. 59·28 crores) ; Metals (Rs. 45·40 crores) ; vehicles (Rs. 23·93 crores) ; Chemicals, drugs and medicines (Rs. 19·30 crores) ; other yarns and textile fabrics (Rs. 15·65 crores) ; Dyes and colours (Rs. 14·60 crores) ; Cutlery, hardware, etc. (Rs. 14·40 crores) ; Paper, pasteboard and stationery (Rs. 10·40 crores) ; and fruits and vegetables (Rs. 9·50 crores).

COMPOSITION OF EXPORTS

(In crores of rupees)

Indian Merchandise

	1950-51	1951-52
Food, drink and tobacco	135·81	157·61
Raw materials and articles mainly unmanufactured	125·80	139·71
Articles wholly or mainly manufactured ...	314·77	400·58
Others	2·61	3·65

Exports of Foreign Merchandise

Food, drink, tobacco ...	0·44	0·26
Raw materials	23·45	9·16
Articles manufactured ...	3·92	4·23
Others	...	·09

Principal Exports and their Destinations

The principal articles exported from India by sea during 1950-51 were cotton yarns and manufactures (Rs. 134·31 crores) ; jute yarns and manufactures (Rs. 113·89 crores) ; tea (Rs. 78·09 crores) ; spices (Rs. 24·44 crores) ; oils (Rs. 21·44 crores) ; leather (Rs. 20·42 crores) ; raw cotton and waste (Rs. 17·32 crores) ; seeds (Rs. 16·98 crores) ; tobacco (Rs. 14·53 crores) ; raw wool and manufactures (Rs. 13·90 crores) ; gums, resin and lac (Rs. 13·60 crores) ; fruits and vegetables (Rs. 10·77 crores) and mica (Rs. 9·61 crores).

(*a*) *Jute manufactures*: The buyers are the U.S.A., U.K., Argentina, Pakistan, Australia, Canada. The U.S.A., the largest importer, takes 46 per cent. of the total jute manufactures. Jute goods, the most important of India's export commodities which account for 35 per cent. of India's total earnings of foreign exchange and over 62 per cent. of the earnings of hard currency, seem to be becoming more and more expensive every day. One of the main advantages of jute goods as containers lay in their cheapness. Today their prices are so high that substitutes made of paper and cotton are being used in the U. S. A. in increasing quantities.

The exports of jute manufactures in 1951-52 were valued at Rs. 270·17 crores.

(*b*) *Tea*: The principal buyers are the United Kingdom, the U.S.S.R., the U.S.A., Pakistan, Canada, Iran and Arabia. The United Kingdom remains the best customer of Indian tea, consuming as she does about 64 per cent. of the exportable surplus. High price of tea is operating against the expansion of tea export trade.

Tea worth Rs. 93·36 crores was shipped from India in 1951-52.

(*c*) *Hides and Skins*: The chief buyers are the U.K., the U.S.A. and Pakistan. The U.K. (67 per cent.) and the U.S.A (15 per cent.) are the largest importers.

Exports of hides and skins, tanned or dressed or leather were valued at Rs. 34 crores in 1952.

(*d*) *Oil-seeds*: Linseed, Groundnut and Castor are the main articles. U.K. is the chief buyer of groundnut and castor. The other buyers are U.S.A., Iraq, Pakistan, Canada, Australia, Italy, Belgium, Ceylon, etc. The U.K. imported 28 per cent. and Italy imported 16 per cent. before the war. In 1950-51, India exported oil-seeds worth Rs. 17 crores.

(*e*) *Lac*: The buyers are U.K., U.S.A. and Australia. The U.S.A. is the chief buyer.

(*f*) *Raw Jute*: The buyers are the U.K., the U.S.S.R., the U.S.A., Brazil, Argentina and Australia. Trade in raw jute has declined considerably after the *partition*. In 1948-49, India exported raw jute worth Rs. 24·26 crores of which the U.K. took Rs. 6 crores and U.S.A. Rs. 4 crores worth.

Exports of cotton yarns and manufactures rose from Rs. 74·31 crores during 1949-50 to Rs. 134·31 crores during the year under review and those of mica from Rs. 6·85 crores to Rs. 9·61 crores

COMPOSITION OF IMPORTS

(In crores of rupees)

	1950-51	1951-52
Food, Drink and Tobacco	106·90	262·04
Raw materials and articles mainly unmanufactured	198·66	253·03
Articles wholly or mainly manufactured ...	258·79	339·71
Other articles	2·20	5·35
	566·56	860·14

Principal Imports and their sources

(*a*) *Machinery*: The chief suppliers are the U.K., the U.S.A., Germany, Japan, France, etc. The U.K. is the largest supplier (70 per cent.). In 1951-52, the Union imported Rs. 104 crores worth of machinery.

(*b*) *Motor Cars, etc.*: The U.K., the U.S.A., Canada, Germany, Italy and France.

Imports of vehicles were valued at Rs. 33 crores in 1951-52.

(*c*) *Mineral oil*: Iran, China, Borneo, Sumatra, the U.S.A., Burma, etc.

It accounted for Rs. 79 crores in 1951-52.

(*d*) *Paper and Pasteboard*: The U.K., Germany, Sweden, Norway, the U.S.A., etc. In 1951-52, India imported goods worth Rs. 14·88 crores.

(*e*) *Silk Manufactures*: Japan, China, Italy, the U.K., etc. Japan sends 73 per cent. in normal times. In 1951-52, India imported silk worth Rs. 33 lakhs.

(*f*) *Chemicals*: The U.K., Germany, Japan and the U.S.A. India imported chemicals in 1951-52 to the value of about Rs. 35·86 crores.

(*g*) *Raw jute*: Pakistan. Indian Union requires about 4·4 million bales of raw jute annually. In 1948-49 India bought Rs. 81 crores worth of raw jute.

(*h*) *Raw cotton*: Egypt, the U.S.A., Kenya and Pakistan. Indian Union requires from Pakistan about 1 million bales of raw cotton annually. In 1951-52, she imported raw cotton worth Rs. 136·46 crores.

(*i*) *Grains and flour*: Canada, Australia, Burma, the U.S.A., Argentina, Siam and Egypt. In 1948-49, she imported foodgrains worth Rs. 131 crores of which 22 p.c. came from Burma, 21 p.c. from Australia, 19 p.c. from the U.S.A. and 12 p.c. from Argentina. In 1951-52, India imported foodgrains worth Rs. 228 crores.

India's Trade Relation with certain Important Countries

The United Kingdom. The most important feature of the direction of India's foreign trade is the fact that it is dominated by the U.K. both in imports and exports. The principal exports to the U.K. are tea, jute, hides and skins, oil-seeds, raw cotton, raw wool, grains, oil-cakes, metals and ores. Tea alone accounts for more than one-third of the value of total exports to the U.K. On the import side, the chief articles are machinery and mill-works, iron and steel, chemicals, instruments, hardware, liquors, motor cars, rubber manufactures, paper and pasteboard, etc. Machinery and mill-works usually comprise one-third of the value of total imports from the United Kingdom.

U. K. TRADE WITH INDIA

Principal Exports and Imports (£ thousand)

U. K. Exports to India:	Full year 1951
Total All Exports	*115,189*
Of which :—	
Machinery	34,389
Vehicles (incl. ships and locomotives)	22,833
Iron and steel and manufactures	6,751
Pottery, glass, abrasives, etc.	2,037
Non-ferrous metals and manufactures	2,505
Cutlery, hardware, implements and instruments	3,978
Electrical goods and apparatus	8,018
Cotton yarns and manufactures	2,709
Woollen and worsted yarns and manufactures	4,550
Silk and artificial silk yarn and manufactures	1,154
Chemicals, drugs, dyes and colours	11,554
Paper, cardboard, etc.	2,125

U. K. imports from India:

Total All Imports	*153,396*
Of which:—	
Tea	44,428
Tobacco	6,974
Non-metalliferous mining and quarry products other than coal	2,675
Non-ferrous metalliferous ores and scrap ...	1,975
Raw cotton and cotton waste	4,227
Wool, raw and waste and woollen rags ...	5,223
Seeds and nuts for oils, fats, resins and gums ...	7,157
Hides and skins, undressed	1,986
Woollen and worsted yarns and manufactures ...	4,610
Coir mats and matting	2,345
Jute manufactures	25,906
Oils, fats and resins, manufactured	2,086
Leather and manufactures	19,917

Pakistan. The significance of Pakistan as a supplier to the Indian Union and the importance of Pakistan as a market for Indain goods are great. Pakistan was second in the list of the markets for the Union's exports in 1948-49. Pakistan is also a valuable source of India's imports. The important articles of import from Pakistan are raw jute, raw cotton, wool, foodgrains, fruits and vegetables. Raw jute and long-stapled raw cotton represent together about 84 per cent. of total imports.[*] The exports from Indian Union are cotton cloth, jute manufactures, gur, iron and steel, coal, tea, cement, paper, etc. In 1951 India's imports from Pakistan by land and sea were Rs. 98 crores and exports to Pakistan Rs. 32 crores, thus leaving an adverse trade balance of Rs. 66 crores.

The Indo-Pakistan Trade Agreement. The trade between India and Pakistan is being regulated by the Karachi agreements of 1951. According to the agreements, India is to import from Pakistan, among other things, raw cotton and jute, cow hides and skins and foodgrains. Pakistan will receive from India coal, cloth and yarn, chemicals, jute manufactures, tyres and tubes, leather and footwear, steel,. cement and several other articles.

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[*] About 60 per cent. of Pakistan's raw jute is taken by India. If, therefore, for any reason, there is any slowing down or restriction of offtake, the Indian jute-manufacturing industry will be disturbed, but the jute-growers of Eastern Pakistan will be more seriously affected.

Burma has a large share in the foreign trade of India. Burma sends 5 per cent. of India's imports and occupies the fourth position in the list of India's suppliers. India sends only 2 per cent. of her total exports to Burma. The balance of trade is, therefore, unfavourable to India. Imports from Burma consists largely of rice, petroleum and teak wood. These represent more than 85 per cent. of the total imports from Burma. More than 40 per cent. of our exports to Burma consists of cotton and jute manufactures. Other exports are iron and steel, tea, sugar and coal. Burma is India's best customer of coal.

In 1950-51, India's imports from Burma were for about Rs. 19 crores and exports for Rs. 22 crores.

Ceylon. The important items of imports into India from Ceylon are: copra, cocoanut oil and tea. Unhusked rice, cotton piece-goods, fish and coal are the important items of exports from India. Ceylon is India's second best customer of coal. Other important items of exports to Ceylon are pulses, fruits and vegetables, chillies, oil-cakes and manures.

India has had a favourable balance for many years in her trade with Ceylon. In 1951-52 India exported goods worth Rs. 17 crores to Ceylon and imported to the value of Rs. 30 lakhs.

Japan. Indian exports to Japan have been continuously declining recently. The balance of trade is unfavourable to India with exports for Rs. 14 crores and imports for Rs. 25 crores in 1951-52. Imports into India from Japan are cotton manufactures, artificial silk, silk manufactures, wool manufactures, glass and glass-wares, iron and steel machinery and mill-works, earthenware and porcelain, toys and requisites for games and hardwares, chemicals, paper and pasteboard and stationery, raw silk, rubber manufactures, electrical instruments and apparatus, paints and painting materials. The principal items of India's exports to Japan are raw cotton, pig iron, manganese, jute (raw and manufactured), mica, shellac etc. Raw cotton usually constitutes more than a quarter of Japan's total imports of foreign goods.

West Germany. In normal times, imports from Germany into India consist of iron and steel, brass and copper, hardwares, machinery and mill-works, glass and glasswares, liquors, paper and pasteboard, woollen manufactures, salt, blankets etc. Exports to Germany consist of jute (raw), grain, pulses, flour, cotton (raw), seeds, hides and skins (raw), lac, coir manufactures, bones, hemp (raw) etc. Jute accounts for nearly one-fourth of the total value of exports to Germany.

In July, 1949, a trade agreement was made between India and Western Germany which provided for the issue by both countries of export and import licences for the following commodities:

COMMODITIES TO BE EXPORTED TO GERMANY

Agricultural products: Groundnuts, fatty acids, groundnut oil, industrial linseed and spices.

Hides and skins: Cow-hides, buffalo-hides, goat-skins, half-tanned bastard skins, tanning agent (myrobalans) and hide cuttings.

Metals: Manganese ore.

Chemicals and related products: Mica, lemon grass oil, sandal-wood oil, gum karaya, ilmenite ore and caustic magnesite.

Pharmaceutical herbs: Senna leaf, senna pods, nux vomica, nux Africa, fennel, ephedra and circuma.

Other items: Sticklac and shellac, crude glycerine, castor seeds and manganese dioxide (Pyrolusite).

Textile materials: Jute, jute shoddy, coir yarn and fibre, hog bristles, cattle tail hair, raw wool and kapok.

COMMODITIES TO BE IMPORTED FROM GERMANY

Chemicals and related products, including the following: Coal-tar dyes, pharmaceuticals, sodium sulphide, zinc oxide, acetic and formic acids, sodium sulphydrate, auxiliaries for textiles and dyes, auxiliaries for textiles on oleic acid basis, tylose and related products, rongalit, Igepon T Powder, highly concentrated anti-oxygen and accelerators, photographic papers, lithopone, titanium dioxide, benzyl alcohol, benzyl acetate, benzoate, sodium benzoate, synthetic raw materials for lacquers, trichlorethylene, plastic moulding compound, chemical reagents for laboratory use and synthetic camphor.

Glasswares : Sheet and plate glass.

Machinery and metal products : Textile machinery, textile stores and accessories, heavy ploughs and spares, printing machinery, tractors, paper making plant and paper machinery, steel plant equipment and accessories, industrial sewing machines, chiefly spares, electric motors—30 h.p. and above, turbine spares, steam turbines, generators, machinery and machine tools, motor car spares, hardwares, chaff-cutter knives, diesel engines and spares, miscellaneous machinery.

Electrical equipment : Electro-medical equipment, switchgear, tubular steel poles, carbon brushes, wiring accessories, installation materials etc., telephone equipment—mainly spares.

Instruments and apparatus : Microscopes, binoculars and telescopes, precision and x-ray cameras and photographic equipment, survey and other optical instruments, fine mechanical and precision instruments, spectacles and lenses, surgical and medical instruments and industrial clock, cinema projectors, miscellaneous instruments.

Iron and Steel : Rolled steel products.

In 1951-52 India imported from Western Germany to the value of Rs. 28 crores as against Rs. 9 crores for exports.

United States of America. India had long enjoyed a favourable balance of trade with the U.S.A. At the present moment, however, India's imports are in excess of exports to the U.S.A. The principal items of exports from India to the U.S.A. are jute and jute goods, shellac and lac, cashew nuts, tea, hides and skins, carpet, wool, leather, undressed furs and mica. The main items of India's imports from the U.S.A. are wheat and bread grains, other foodstuffs, chemicals, machinery, unmanufactured tobacco, metals and metal manufacturers, petroleum and its products, textiles and raw cotton. The excess of imports over exports is due primarily to India's need for large quantities of foodgrains. Thus India's balance of trade with the U.S.A. depends on the extent to which India would continue to import foodgrains and capital goods and also on India's ability to increase exports of commodities to America.

Value of Imports from the U. S. A.		*Value of Exports to U. S. A.*	
	Rs.		Rs.
1949-50	94·41 crores	1949-50	79·76 crores
1950-51	115·82 „	1950-51	110·10 „
1951-52	287·91 „	1951-52	129·93 „

In 1951-52 the U.S.A. was the best supplier and the second best customer of India.

India's Trade Agreements. India has concluded trade agreements with several countries. These agreements constitute an important development in India's foreign trade policy. The agreements concluded are with Czechoslovakia, Egypt, Finland, Germany, Hungary, Japan, Pakistan, Poland, Switzerland, U.S.S.R. and Yugoslavia.

India has Land Frontier Trade with Pakistan, Nepal, Tibet and China. The principal commodities that are imported by India from these countries are grain, jute, fruits, raw wool, living animals and raw silk. The most important exports are cotton goods, sugar, leather manufactures, tea, silk goods, iron and steel goods and salt.

India has also a large Entrepot Trade. The entrepot trade of a country consists of the re-export of articles previously imported. In other words, a country which imports things with a view to exporting them is known to have entrepot trade. India occupies a very favourable geographical situation for the purpose of doing entrepot trade as she is at the centre of the Eastern Hemisphere.

From the West, cotton, chemicals, machinery, minerals and metals are imported for distribution to countries like Kenya, East Africa, Japan, Straits Settlements and China.

PORTS AND TRADE CENTRES

Industrialisation of a country may be measured by the growth in the number of its cities. In India the great majority of the people derive their livelihood from agriculture. Consequently there is a great variation in urban and rural population. About 11 per cent. of the total population live in the cities or in the suburban districts of India.*

There are only 49 cities in India with a population of two classes—those having more than 2,00,000 and those having less than 2,00,000.

TOWNS WITH POPULATION OF 100,000 AND OVER

(1941 Census)

Provinces	Number of Towns	Provinces	Number of Towns
Bombay	4	C. P.	2
West Bengal	4	Delhi	1
Madras	6	Ajmer-Merwara ..	1
U. P.	12	States and Agencies ..	13
East Punjab	3		
Bihar	3		49

TOWNS WITH POPULATION OF 200,000 AND OVER

(In 000)

Towns	Population	Towns	Population
Calcutta	3,109	Banaras	263
Howrah	379	Kanpur	487
Ahmedabad	591	Lucknow	387
Bombay	2,490	Allahabad	261
Poona	258	Amritsar	391
Sholapur	213	Nagpur	302
Madras	1,077	Delhi	1,022
Madura	239	Bangalore	248
Srinagar	208	Hyderabad	739
Agra	284	Indore	204

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* A town in India means a collection of houses, inhabited by not less than 5,000 people. A city is a town with over 100,000 inhabitants.

TOWNS WITH POPULATION OF LESS THAN 200,000

(In 000)

Towns	Population	Towns	Population
Bhatpara (Bengal)	177	Gaya	105
Surat	171	Jamshedpur	149
Calicut	126	Patna	176
Coimbatore	130	Jubbulpur	178
Salem	130	Ajmer	147
Trichinoply	160	Baroda	153
Bareilly	193	Bhavnagar	103
Jhansi	103	Bikanir	127
Aligarh	113	Jaipur	176
Meerut	169	Jodhpur	127
Moradabad	142	Kolar (Gold field)	134
Saharanpur	108	Lashkar (Gwalior)	182
Shahjahanpur	110	Trivandrum	128
Jullandhar	135	Mysore	157
Ludhiana	112		

Principal Ports

A modern port is in effect an important junction or point of transfer in overseas trade, either for a further voyage or to land transport—more particularly, of course, by rail, but also by inland water channels, whether natural or artificial and now by road to a constantly increasing extent.

The fundamental importance of a port consists in the extent and productiveness of its hinterland. Hinterland means a region to which a port acts as a "door". The extension of facilities of transportation determines the size of a hinterland while the productivity is measured by its products and density of population.

There are two classes of ports in India : major and minor. "The sheltered nature of a port, the well-laid-out approach channels, the provision of docks, jetties and moorings, the well-laid-out transit sheds, the effective rail connections, the ability to serve a very large portion of the hinterland lying behind the port, the facilities for meeting the requirements of defence and strategy, the comparatively large volume of traffic and the possibilities of work for shipping all the year round, usually distinguish a major port from a minor port."

India is a vast country with a coast-line of about 2,000 miles. Unfortunately her coast-line has few indentations and consequently she has only a few major ports for trade. The southern side is deficient in harbours to accommodate large vessels now employed in sea-borne trade. The violence of monsoon keeps the ports of the western coast of India, with the exception of Bombay and Mormugao, closed to traffic from May to August. Then, again, the eastern coast is surf-bound and as such requires constant dredging.

The chief ports of India are Bombay, Mormugao, Bangalore, Tellicherry, Mahe, Calicut, Cochin, Tuticorin, Nagapatam, Pondicherry, Madras, Masulipatam, Vizagapatam, Cocanada and Calcutta. But of the total sea-borne trade of India, more than 90 per cent. is shared by Bombay, Calcutta, Cochin, Madras and Vizagapatam. The ports on the coast of the Deccan have restricted hinterlands, but recently some of them have been enlarged by the development of railways and other communications.

The average ship-borne traffic in India is 20 million tons per annum and the total optimum handling capacity of the major ports is hardly more. Any increase in trade results in congestion at the ports. In 1948-49, the position of the different ports in respect of turnover cleared was as follows:

	Million tons		Million tons
Calcutta ..	8	Cochin	2
Bombay ..	6		
Madras ..	2·50	Vizagapatam	·50

The concentration of India's ocean-borne trade in these major ports is due to a number of causes. Geographical cause is, no doubt, important, but the more important is the historical one. Bombay, Madras and Calcutta have been centres of administration for a long time. Population increased and with it commercial and industrial activities were inspired. Moreover, the railway systems were constructed from these ports during the latter half of the 19th century. Thus from political and railway centres they developed into great ports.

THE PRINCIPAL PORTS ON THE WESTERN COAST OF INDIA

Kathiawar ports are Okha, Bedi Bandar, Probandar and Bhavnagar. Bedi Bandar, in Nawanagar, is a small port which does considerable coastal trade. The sea is shallow and, therefore, large steamers must anchor about 2 or 3 miles away from the shore. *Okha,* in the Baroda State, occupies a very good position at the extreme north-east point of the Kathiawar Peninsula. Although the sea in this part is deep enough for large vessels, the circuitous approach to the port makes navigation rather dangerous and the scanty population and small railway mileage of the hinterland stand in the way of its development. The port is open at all seasons of the year and competes sometimes with Bombay by offering lower port charges. The imports are textile machinery, motor cars, sugar and chemicals. The exports are oil-seeds and cotton.

There is at present no major port on the Kathiawar-Cutch coast. With the loss of Karachi, the 1,000 mile long coast-line between Bombay and Karachi is badly in need of a major port to serve the hinterland. The Government of India have decided to develop *Kandla,* a small port of minor importance into a major port. The urgency of a major port between Bombay and Karachi was felt as early as 1946 by the Ports Committee. Partition of the country made it still more necessary because of the loss of Karachi. The West Coast Major Port Development Committee recommended it that in 1948 a major port should be located at Kandla. The present port of Kandla was built in 1930 to meet the requirements of the Cutch State only. There is only one jetty to provide a single berth for medium-sized ships. A narrow gauge railway links the port with certain parts of Cutch.

Kandla creek, situated at the eastern end of the Gulf of Cutch, constitutes a natural sheltered harbour and is easily navigable. It has a depth of water of over 30 feet, suitable for ocean-going ships. Kandla has a bar across the entrance to the creek. The deep channel over the bar has a minimum depth of 13 feet and the minimum rise of the tide on any day of the year is 17 feet. There has been no deterioration in the navigational conditions at the mouth of the creek over a period of 20 years. The geographical position of the port is also best suited to replace the port of Karachi in its services to the hinterland covering Kutch, Saurastra, Northern part of Bombay, Rajasthan, Punjab, Kashmir and Western U.P. As between Kandla and Karachi, Delhi is 656 miles from Kandla as against 783 miles from Karachi. Similarly Hissar is 688 miles from Kandla as against 733 from Karachi. Moreover, potentialities for development of industries and mineral resources in the territory of Cutch are vast, in particular, those of fish, cement, glass, gypsum, lignite and bauxite. The present disadvantages of Kandla are non-existence of trade facilities and rail-communications. But it is possible to construct in three years' time two rail connections —one from Jhünd to Kandla with a bridge over the little Runn

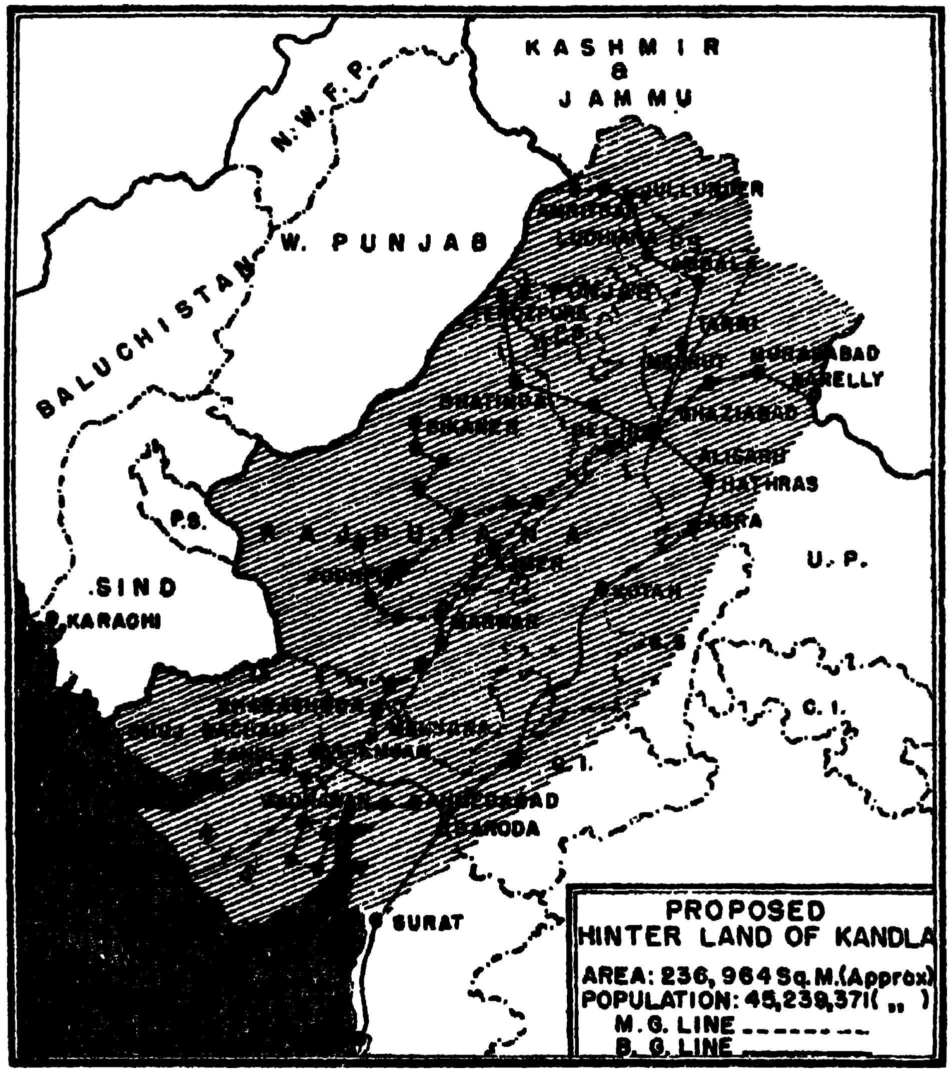

Fig. No. 146. In area, it will be the third largest hinterland in the Union. Kandla will provide an outlet for the large hinterland covering Cutch, Saurastra, Northern part of Bombay, Rajasthan, Punjab, Kashmir and Western U. P.

of Cutch and the other from Radhanpur to Kandla. There is at present an air-port at Bhuj, and the Government have considered the question of providing another one near Kandla.

Work of the construction of the new major port of Kandla has been taken up vigorously since 1949. Of all the problems confronting the development of the Kandla port town, the subject of water-supply is the main one. Cutch is an arid area, and the annual rainfall is little above 12 inches. So, an adequate water supply must be assured before the port is developed. There is a substantial reservoir of underground water around Kandla—enough for the port and the town. There is also a surface water reservoir with a storage capacity of 448 million cubic feet which can be utilised in years of satisfactory rainfall. Among the facilities that will be available at the Kandla port when it is fully developed will be (*a*) four deep-water cargo berths, (*b*) four ware-houses, (*c*) five mooring berths in the stream, (*d*) an oil berth to take large tankers, (*e*) a floating dry dock for small crafts, and (*f*) a floating landing stage for passenger launches. The traffic expected to flow through the port will be about 8,50,000 tons a year. The latest bore hole that has been sunk for underground water is reported to be yielding 35,000 gallons of water per hour. } Kandla

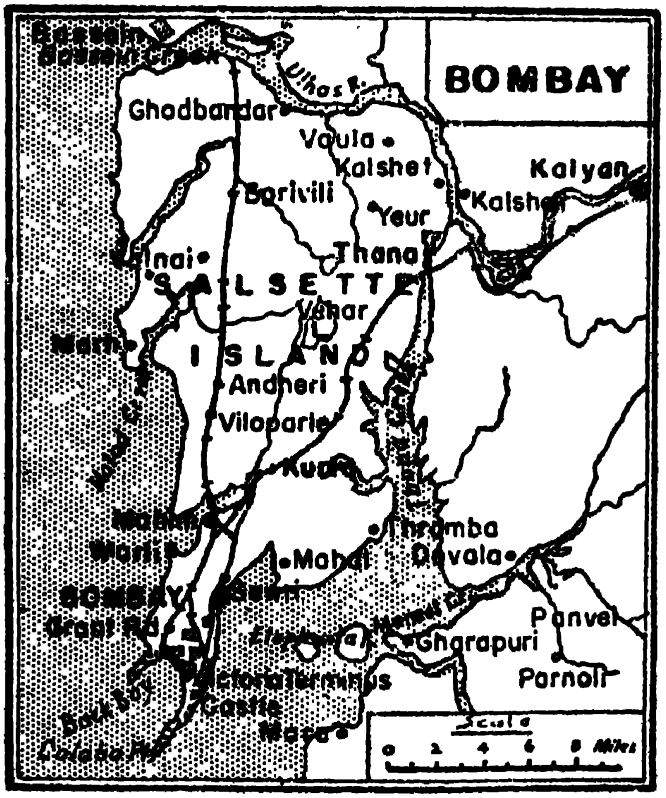

FIG. No. 147. Bombay is an inland port. It is connected with the mainland by railway bridges. The shape of Bombay Island is something like a lobster's claw, the pincers of the claw being Malabar point and Colaba point, and Back Bay the deep curve between.

Bombay lies at the base of the Western Ghats. It has a natural harbour directly on the sea. The hinterland of Bombay extends from Hyderabad and the western part of Madras in the south to Delhi in the north, and includes Western U.P., Eastern Rajputana, M.P., Madhya Bharat and the Bombay State. It is the second city in the Indian Union and owes its importance to its magnificent harbour and its position as the nearest Indian port to Europe. It is connected with the interior by railways (Western Railway and Central Railway). It is the seat of the cotton textile industry. Although Bombay does not possess rich coal-fields within 200 miles or a system of navigable rivers to bring produce down to the port, her volume of trade is always large in view of her natural harbour which is open at all times of the year. Bombay is the principal outlet for the staple products of Western India, in particular, the raw cotton of the Deccan. Large quantities of oil-seeds, wool and woollen goods, hides and skins, manganese ore and foodgrains are exported. The principal imports are manufactured cotton goods, machinery, railway plant, iron and steel goods, hardware, sugar, kerosene oil, dyes, coal and petroleum. In the year 1947-48 the Bombay port handled 3·6 million tons of imports and 1·4 million tons of exports. Recently the traffic of the Bombay port has considerably increased because of the loss of Karachi due to partition.

Mormugao, on the Konkan coast, is situated on the eastern extremity of the Mormugao peninsula in Portuguese India. Its hinterland extends to Bombay-Deccan, Hyderabad and Mysore. Manganese, groundnuts, cotton, cocoanuts etc., are the principal exports.

Calicut, 90 miles north of Cochin, is a port of periodical importance. During the early part of the monsoon, the port is practically closed to navigation. As the sea is shallow, steamers anchor about three miles off the shore. Coir, coir-fibre, copra, coffee, tea, ginger, groundnut and fish manure are the exports.

Cochin, in Madras, is the most important port between Bombay and Colombo. Its position is such that it can serve the whole of Southern India. Cochin is nearly 300 miles nearer to Aden than Bombay. "The system of back-waters running parallel with the coast affords cheap transport and excellent waterways connecting several places of importance in the Cochin and Travancore States." Coir, yarn, coir mats and mattings, copra, cocoanut oil, tea and rubber are the chief exports from Cochin.

THE PRINCIPAL PORTS ON THE EASTERN COAST OF INDIA

Tuticorin, an important port of the Madras Presidency, is situated at the extreme south-eastern point of the Peninsula. The harbour is shallow, and constant dredging is necessary. Cotton, tea, senna leaves and cardamoms are the principal exports. The port has considerable trade with Ceylon. The value of foreign trade in 1938 was worth Rs. 10 crores, of which exports amounted to Rs. 5·5 crores.

Madras, the third largest city in India, is the chief port of the State. Several railway lines connect it with Bombay, Tuticorin, Calicut and Calcutta. Although the port has considerable manufactures, it cannot be compared with Calcutta or Bombay as a trade centre. Its extensive hinterland includes the whole of the Eastern Deccan, but then this area does not produce things which are required by the European markets in large quantities. Moreover, many small seaports on the Coromondal and Malabar Coasts compete with Madras. Madras handles only some 5 per cent. of India's foreign trade. Its harbour is artificial. Before the construction of the harbour, Madras was an open roadstead with a surf-beaten coast. The imports are cotton piecegoods, iron and steel, machinery, dyes, sugar, leather goods, paper etc. The chief exports are oil-seeds, raw cotton, coffee, tobacco, rubber and fish. It is also an industrial town, but lack of coal is its great handicap. The Madras harbour is

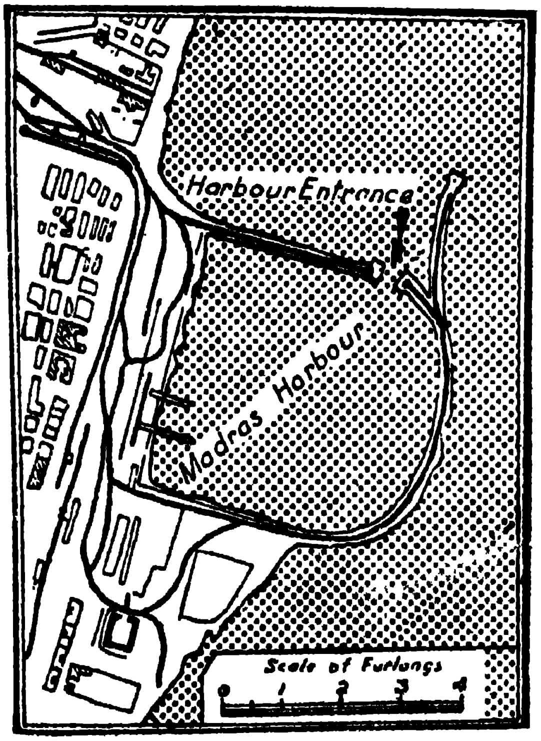

FIG. No. 148. Madras is an artificial harbour ill-suited to shipping during cyclones which occur in October and November.

the only port on the east coast of India which can admit vessels up to 26 feet draft. It is an entirely artificial harbour, enclosing about 200 acres by quay walls extending 3,000 feet into the sea. As originally completed in 1895, it had an entrance from the east quay. This allowed waves into the harbour, practically throughout the year which severely handicapped loading and unloading of cargoes.

The harbour was, therefore, remodelled in 1911. The old entrance was closed, a new entrance opened in the north quay and a sheltering arm constructed. This measure was quite effective in reducing disturbance in the harbour in all weathers except severe storms.

Generally in the months of October and November, cyclonic storms occur in the Bay of Bengal which generate waves as high as 11 feet. The deep sea waves become translatory as they approach the shore and cause a bodily movement of water. Such waves, at the entrance of the harbour, developed a slow periodic surging of the water mass in the harbour. This is called 'range'. Such undulations of the water level produce a fore and aft motion of ships which goes on increasing till even the strongest ropes snap. One such ship let loose from its moorings can do untold harm to others. Ships are, therefore, instructed to leave port in such weather. An all-weather port on the east coast is a necessity. The value of foreign trade in 1950-1951 was Rs. 224·57 crores of which exports accounted for Rs. 126·36 crores.

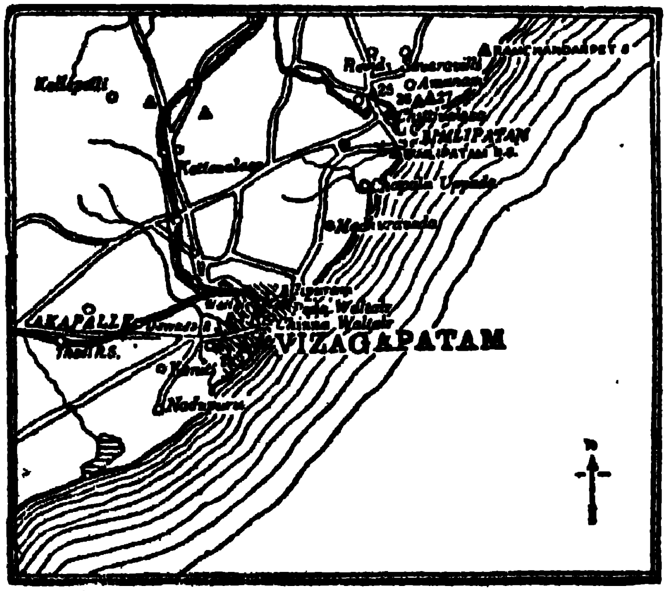

FIG. No. 149. Vizagapatam port.

Vizagapatam: It has become a major port within very recent years. It is a port of call for all ocean-going and coastal traffic steamers. It is situated on the Coromondal Coast, about midway between Madras and Calcutta—500 miles south of Calcutta and 325 miles north of Madras. Manganese, groundnuts, myrobalans, hides and skins are the chief exports. Cotton piece-goods, iron, timber and machinery are the important imports.

For shipping the produce of Orissa and the eastern part of M.P., Vizapapatam offers better facilities in respect of distance and charges than Calcutta. To a certain extent Calcutta has been affected adversely by the opening of this young port. Recently a ship-building yard has been opened here. The port is connected by the Eastern Railway with Raipur in M.P. The opening of the line has greatly reduced the distance to M.P. markets.

Calcutta, the largest city in India, is situated on the left bank of the Hooghly, nearly 80 miles from the Bay of Bengal. Although, primarily, it is a port for the Gangetic plain, it is also the greatest trading centre to the east of the Suez. Its hinterland comprises Assam, Bengal, Bihar, the Uttar Pradesh and parts of the Eastern Punjab, Orissa and Madhya Pradesh, which are all connected with Calcutta by roads and railways. All these areas produce in large quantities goods which are wanted by foreign markets. The Ganges and the Brahmaputra by providing splendid natural waterways help to bring agricultural produce of the plains to be exchanged for the manufactured goods in Calcutta. As a matter of fact, the trade of Calcutta depends to a large extent upon waterway communications. It was estimated that, before partition, about 25 p.c. of the merchandise reaching Calcutta from the rest of India came by

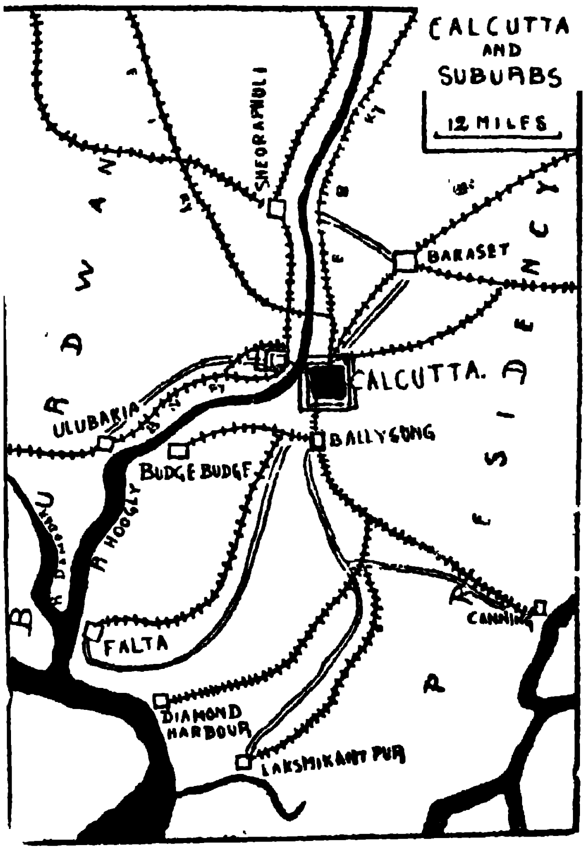

Fig. No. 150. Calcutta and its suburbs.

waterway, and approximately one-third of this from Assam. As regards trade from Calcutta, about one-third was carried by water and of this nearly three-quarters went to Assam.

The port of Calcutta, which extends for about five miles along the banks of the Hooghly, suffers from the disadvantage of its river being silted up. The frequent formation of tidal bore in the Hooghly is another difficulty. In spite of these defects, Calcutta held during the World War II *the record of being the fastest cargo-handling port in the world.* The port authorities are planning the provision of greater facilities for incoming and outgoing ships. A proposal is being examined for a *30-mile ship canal from Kidderpore to Diamond Harbour.** Calcutta with its suburbs is the greatest manufacturing area in India. Its jute mills, paper mills, cotton mills, sugar factories, engineering works etc., use coal of Raniganj and Jharia. Calcutta is the greatest jute centre of the world. Other industries of importance are rice mills, cotton mills, tanneries, perfumeries, iron and steel works and match-making. The principal exports are jute, tea, mica, coal, iron, manganese and shellac. The principal imports are iron and steel goods, sugar, petroleum, motor car, paper, chemicals, liquor, salt, rubber and cycle. In

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*** The proposal for connecting the port of Calcutta with the Sea by a ship canal.**

There is no deep-water harbour in Calcutta and the vessels of more than 9,000 tons have to dock at Diamond Harbour, 40 miles down Kidderpore. To increase the port facilities it was proposed to connect the port of Calcutta with Diamond Harbour by a ship canal. This idea of a ship canal is not new, and, as a matter of fact, this proposal was examined seriously in 1945.

Apart from the question of heavy expenditure on the scheme, the main difficulty will be that many villages between Diamond Harbour and Kidderpore will have to be destroyed in the process of execution of the scheme entailing not only hardship on thousands of villagers but also loss of rice fields.

Another problem is the Hooghly itself. If the canal is constructed, the Hooghly will not receive proper attention. It must not be forgotten that "the Hooghly provides the only outfall channel for the rivers of West Bengal and its abandonment would only aggravate the flood menace during the rains, but that the whole area would, as a consequence, get water-logged and unproductive." The Nadia rivers are also linked up with the Hooghly, both upstream and downstream of Calcutta. Therefore, the Hooghly should be revitalised by the infusion of fresh water from the Ganges so that upstream and downstream navigability of the Hooghly may improve. The Government of India has taken in hand the *Ganges Barrage scheme* which, if completed, will make the entire length of the Hooghly navigable by bigger vessels. In that event, the port of Calcutta will develop further without having a ship canal.

1947-48, the total tonnage of imports discharged in the port was about 2·5 million tons and the exports amounted to 4·5 million tons. The value of foreign trade of Calcutta in 1950-51 was Rs. 400 crores of which exports accounted for Rs. 263·86 crores.

In 1941, the population of Calcutta was 3 million. Since then because of the large influx of people from the Eastern Pakistan as well as of the war-time activities of the town, the population has considerably increased.

Trade Centres

Trade centres have grown in six different classes of cities in India. These are: (*i*) holy cities, (*ii*) ancient capitals, (*iii*) ports, (*iv*) health resorts, (*v*) manufacturing cities, and (*vi*) modern administrative capitals.

India is a land of *holy cities*. Banaras, Puri, Allahabad, Mathura, etc., have become important trade centres because of the assemblage of pilgrims. Some of the *ancient capitals* of India like Nagpur, Poona, Murshidabad, etc., are still important as centres of trade. *Health resorts* are mostly confined to the sea-sides and the hills where people in large numbers from the plains go for a change. *Ports and manufacturing centres* in India command the largest trade because of railways and navigation facilities. Administrative reasons have also led to the development of many towns in districts, divisions and provinces of India.

The inland trade centres of India are mainly to be found in the Indo-Gangetic plain which is favoured by two mighty rivers —the Ganges and the Brahmaputra. The industrial centres have all grown on the banks of these rivers and their tributaries or at the junctions of railways.

The UTTAR PRADESH has an area of 110,000 sq. miles and a population of 55 million. It has made a fairly good progress in agriculture, manufactures and road development. The principal crops are wheat, sugar cane, mustard, rice and pulses. Its position in respect of minerals is not at all satisfactory. Recently its Government has entered into an agreement with the Government of Nepal for developing the Dang coalfield. A cement factory on the south bank of the river Sone in Mirzapur district is being set up. In the production of power alcohol, the State has made good progress. There are at present 9 distilleries producing 9½ million gallons of power alcohol per annum. Two factories for the production of Rayon yarn—one near Allahabad and the other in Dehra Dun are being established. The State contains at present the largest number of sugar factories, a few cotton mills and paper and glass factories. The important trade centres are Allahabad, Banaras, Kanpur, Gorakhpur, Lucknow, Mirzapore, Moradabad, Aligarh and Agra.

Allahabad, 564 miles from Calcutta, is the principal railway centre of the U.P. It is situated at the confluence of the Ganges and the Jumna. There are several oil mills, glass factories and flour mills in the city. The trade is considerable, because the city enjoys unique advantages in regard to communication by rail, roads and rivers. Jowar and bajra, linseed, tobacco etc., are collected from the surrounding districts for export. *Banaras,* on the bank of the Ganges, is one of the biggest towns of India. The city being a place of pilgrimage to the Hindus, the pilgrim traffic is enormous. It is also an important industrial and commercial centre. Toys of wood, zarda, lac bangles, ivory articles, silk cloth, blanket sheets, linseed, mustard seed, sugar and gram are the chief articles of trade. There are several oil mills and silk factories. The place is also noted for brass-works. The famous Hindu University is situated at a distance of three miles from the city. *Kanpur* is a great collecting and distributing centre for Northern India. It is also an important railway junction of the Eastern, Western and North-Eastern Railways. It has the largest manufacturing industries in the U.P. Cotton pressing and ginning are the foremost. Sugar mills, flour mills, iron foundries, chemical works, cotton mills and oil mills are the important industries. The population of the city is over 2,50,000. *Gorakhpur* is situated on the left bank of the river Rapti. The chief industry is carpentry. Timber is brought here from the Nepal border. The city has a large number of sugar factories. *Lucknow* is an important distributing centre for the rich agricultural produce of Oudh. The city is growing in importance rapidly. There are several railways and iron foundries. The articles of trade are silver and gold-works, ivory and wood carving, pottery and perfumes. *Mirzapore,* an important industrial town in the U.P., is situated on a fertile tract of land on the bank of the Ganges. Carpets, rugs and silk cloths are the chief manufactures. Its stone business is also famous. *Moradabad,* the most important town of the district of Moradabad, is noted for brasswares. It has a population of 1,10,000. *Agra,* on the Jumna, is an important centre of arts and manufactures. The articles of trade are carpets, shoes, brass utensils, looking-glass frames and marbles. It is an important railway junction. It is also a collecting and distributing centre for Rajputana. The famous Taj is situated at a distance of one mile from the city. *Aligarh* is famous for its manufacture of locks and other brasswares. Bangles, glasswares and butter are other articles of importance. It is the seat of Muslim culture in India.

PUNJAB has an area of 48,000 sq. miles. Its population is a little above 13 million. The refugees from the West Pakistan form about one-fifth of the total population. The State has suffered much on account of partition since it has "received less than its due share, on population basis, of irrigated area, particularly the canal irrigated area." The main problem of the State is the problem of rehabilitation of refugees. The important trade centres are Amritsar, Ludhiana, Jullundhar and Simla. *Amritsar* stands on the main line of the Northern Railway and is 1,143 miles away from Calcutta. It is famous for its carpets and shawls. The other important industries are the manufacture of textiles, acids, chemicals, hosiery and leather. *Ludhiana* is the centre of hosiery manufacture. Ludhiana supplies turbans practically to every Indian regiment. *Simla* was the summer capital of the Government of India. It has an entrepot trade with Tibet and China. Its trade is generally busy from March to October.

MADHYA PRADESH (the *Central Provinces*) has an area of 1,30,000 sq. miles with 17 millions of people. It is one of the richest states of India in minerals. There are large deposits of coal, bauxite, iron, copper, manganese, limestone etc. No large-scale industrial use of the minerals has so far been made. Nagpur, Yeotmal, Katni, Wardha, Jubbalpore, Akola and Amraoti are the principal market places. *Akola* and *Amraoti* are the two chief centres of cotton trade. *Jubbalpore* is noted for cement, glass, lime and potteries. It has a gun-carriage factory. Its other industries are cotton textiles, brass and copper utensils, etc. *Katni* is an important centre for utensils, stones and grains. *Nagpur,* the capital of Madhya Pradesh is a very important commercial town. It is situated at the junction of the Central Railway and the Eastern Railway. Its cotton trade is important. *Yeotmal* and *Wardha* are important cotton marts and have ginning factories.

WEST BENGAL is a densely populated province. It has an area of 28,000 sq. miles and it contains a population of more than 21 million people. Though small, West Bengal is a highly developed area. Its industrial activity, electrical development and transport facilities are of high order. Yet the economic position of this state is precarious. Its problem is to-day one of economic survival. The State is a deficit area and produces about 3½ million tons of foodgrains, whereas its consumption is about 4 million tons. It is dependent on Pakistan for its requirements of raw jute. It has now about 21 million acres of land under cultivation. The Damodar Valley project will bring another 1·3 million acres under crops by 1953. Forests cover only 14 per cent. of the area in West Bengal. In industrial development, however, it is next to Bombay. It has all the jute mills, several chemical and glass works etc. The important trade centres are Calcutta, Serampore, Berhampore, and Burdwan. *Serampore* and *Salkea* are two important industrial towns, situated near Calcutta. Both the towns possess a number of cotton mills. *Batanagar,* on the Hooghly, is a new industrial place, famous for shoe-making.

The STATE of BOMBAY has an area of 152,000 sq. miles with more than 24 million people. The State has developed its own resources to a great extent. It is, however, a food deficit area. The textile industry is the most important one not only from the point of view of the State itself but also from that of the country. There is, however, much over-concentration of textile industry at two or three centres. This has created difficult social and economic problems for the industry and the centres. The trade centres are Bombay, Ahmedabad, Belgaum, Broach, Nasik, Poona and Surat. *Ahmedabad* stands on the left bank of the Sabarmati and is 50 miles away from the head of the Gulf of Cambay. It is the second largest cotton-manufacturing centre in India. There are nearly 80 cotton mills. *Belgaum* is a silk and cotton centre. *Broach* has a large coastal trade. It is one of the oldest ports of Western India. *Nasik* is noted for brass and copper vessels. *Surat,* once an important port, is to-day famous for gold and silver thread industry. There are a few cotton mills.

In the STATE of MADRAS the principal trade centres are ports. The State has an area of 142,227 sq. miles. Madura and Trichinopoly are the two inland trade centres. *Madura* has several weaving mills. Copper and brass vessels are also made here. In *Trichinopoly* there are many cigar factories.

DELHI, in the State of Delhi, is situated at the junction of many railway lines. It is the administrative centre of both the State and the Republic. It is an important clearing house for the East Punjab and the western districts of the U. P. in cotton, silk and woollen piece-goods. It has several cotton spinning and weaving mills. Ivory carving, jewellery works, lace works and gold embroidery are the other important activities.

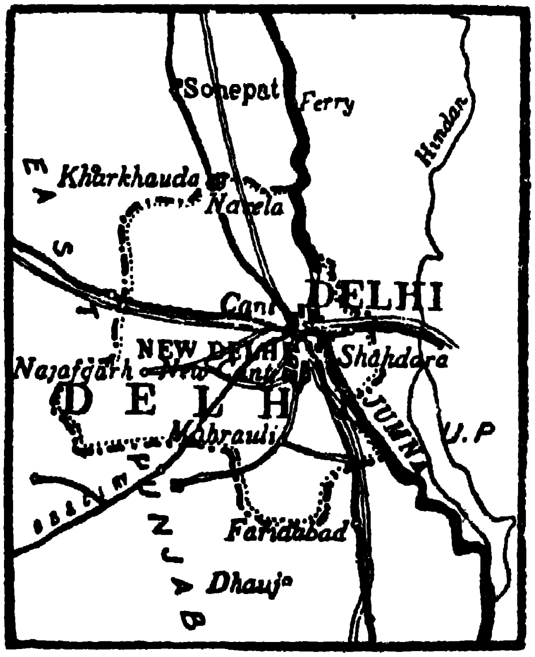

FIG. No. 151. Delhi—its environs and communications.

ASSAM is the most easterly State of India. It is the only State in the Republic which has two international frontiers and as such, it has much strategic importance. Two-thirds of its area are inhabited by aborigines who form one-third of its population. It has an area of 55,000 square miles with 10 million population. The province is rich in natural resources and holds out immense possibilities for many industries. Forests cover 40 per cent. of the total area. It has also large virgin tracts almost ready for cultivation. It is also known to be very rich in mineral wealth. "As the only internal source of oil, Assam, it is realised, has an importance of its own for the country, but there is urgent need to explore the possibilities of further development of its oil resources." Its mineral wealth has practically not been touched. It has also a variety of minerals like limestone, glass-sand, ilmenite, abrasives and white clays.

It has also vast hydro-electric resources. Agriculture is mainly confined to the Brahmaputra valley, and the principal products are rice and tea. The trade centres of the province are Shillong and Gauhati. Paper pulp is also made here. *Shillong,* the capital of Assam, is in the Khasi Hills on an altitude of 4,000 ft. above sea-level. Fruits and hill-products are the articles of trade. The population is more than 30,000. *Gauhati,* on the left bank of the Brahmaputra, is the largest town and the most important port of Assam. It has a population of more than 35,000. Gauhati is a commercial centre and handles, as a port or a railway centre, silk, tea and timber.

ORISSA has an area of 32,000 sq. miles with a population of more than 8 million. Though rich in resources, the province is very backward in industrial development. The backwardness is due to its high death rate, very low level of literacy, dependence on a single crop (rice), frequency of floods, lack of industrialisation and inadequate communications. The State, however, has substantial resources in forests, mines and rivers.

About 25 per cent. of the population consists of *Adibasis* (aborigines). The principal trade centres are Cuttack, Puri, Sambalpur and Balasore. *Cuttack,* the capital of Orissa, has a population of more than 70,000. The local manufactures comprise lac bangles, shoes, toys and combs. It also collects timber from M.P. and other places and sends them to Calcutta by the Eastern Railway. It is on the main line of the Eastern Railway and is connected by the Orissa Coast Canal with Chandbali. The city is 253 miles from Calcutta. *Puri,* a holy place of the Hindus, is an open roadstead. As the sea is shallow, the steamers anchor about 7 miles away from the shore. The local manufactures consist of brass, silver and golden ornaments. *Sambalpur* is an important silk and cotton-weaving centre.

Jaipur is the capital of Rajasthan. The city has a population of more than a lakh. It is famous for its artistic pottery and brass-wares. *Jodhpur,* in the Jodhpur State of Rajasthan, has a railway workshop and woollen and cotton mills. Stone-works are also important. *Gwalior* is the capital of Madhya Bharat and has a population of nearly 1 lakh of persons. The name of the city is Lashkar. It has important stone-works and cigarette manufactures. The city also boasts of many cotton mills and pottery works. *Indore,* the largest trade centre of Madhya

Bharat, has cotton mills, flour mills, brass-work foundries and metal-works. It has more than a lakh of population. *Bangalore,* in Mysore State, is 220 miles east of Madras. Carpets, cotton textiles, woollen goods and leather are the principal manufactures. Soap, shellac, furniture and porcelain are also made. The population is nearly half a million. *Srinagar,* the capital of Kashmir, is famous for silk, embroideries and carved woodwork. A large hydro-electric works has been installed at Buramulla to supply power to Srinagar. The city has a population of over 1,80,000. It has no railway communication, but excellent motor roads connect the city with the neighbouring areas. *Trivandrum,* in Cochin-Travancore State of the extreme south-western India, is an important industrial, commercial and educational centre. It is noted for coir fabrics, pencils, ivory works, cement and nuts.

QUESTIONS

1. Account for the variety in the distribution of rainfall in India, and show its effect on the chief products. (Cal. Inter. 1941).

2. Divide India into natural regions. Describe the climate, products and industries in each of them. (Cal. Inter. 1948; W.B.C.S. 1949).

3. India has a population of above 350 millions. Analyse the factors which determine the irregular distribution of population in India. (Dacca Inter. 1941; Cal. Inter. 1934, 1940, 1942).

4. Examine and estimate the importance of the following agricultural products in India: (*a*) Wheat, (*b*) Rice, (*c*) Maize, (*d*) Cotton and (*e*) Jute. (Cal. Inter. 1932, 1935).

5. On a sketch map of India, locate the places where hydro-electric power is being utilised for irrigation purposes. What manufacturing industries, in your opinion, can be developed in these places? (Cal. B. Com. 1927, 1938).

6. On a sketch map of India show the regions where iron, manganese and mica are found. Which of these minerals are mined for home consumption? Name the countries of the world that compete with India in manganese for export markets. (B. Com. 1937).

7. Describe the principal coal-fields of India and discuss the present condition of the coal industry in India. (Cal. Inter. 1938).

8. Examine the iron resources of India. Show how far these are located near the coal-bearing areas in India. (Cal. Inter. 1936).

9. On a sketch map of India, show the regions with important timber resources. How are these utilised at present? Discuss the prospects of increasing exports of Indian timber to the world's markets. (Delhi B.A. Hons. 1950).

10. (*a*) Examine the present position and the future prospects of the fishing industry in West Bengal. (W.B.C.S. 1949).

(*b*) Give an account of the iron and steel industry of India with special reference to (*a*) sources of raw materials and (*b*) geographical reasons for the location of the industry. (Delhi B. Com. 1952).

11. (*a*) Account for the location of the jute mill industry on the banks of the Hooghly basin. Discuss the position of this industry in regard to raw jute supply. (Agra B. Com. 1952).

(*b*) On a sketch map of India, show the important regions of wool production together with the centres for imported wool. Where is the Indian wool mainly consumed? (B. Com. 1941).

12. How is it that in India most of the hydro-electric installations are located in the Deccan? Discuss the factors which should be present for the development of hydro-electric power. (Cal. Inter. 1949).

13. What special advantages has Bombay for the establishment of cotton mills? Do you think Orissa and Assam are proper places for the development of cotton textile industry? (Delhi U. Prep. 1950).

14. To what parts of the world outside India have Indians migrated in large numbers? Why have they so migrated? What are their economic activities? (I. I. B. 1948).

15. For the development of communication facilities in India, would you favour extension of railways or construction of roads, or both? Give your reasons. (Cal. Inter. 1940).

16. Discuss the possibilities of linking up the Indian railways with railways in other countries of Eurasia. Examine the probable effects of such linking up on the overland foreign trade of India. (I. I. B. 1931).

17. Give a brief account of the articles which enter and the countries which participate in the external trade of India carried on by land routes. What steps should be taken for its improvement? (B.A. Hons. 1941).

18. Have you got any idea about the trade which India carries on with other countries by land route? What are the countries which participate and the commodities which enter in this trade? (Cal. Inter. 1941).

19. Write a short essay on the foreign trade of India stating (*a*) imports and their sources, and (*b*) exports and their destinations. (Dacca Inter. 1940; Cal. Inter. 1933; B. Com. 1937).

20. What is hinterland? Give an idea of the hinterland of Calcutta and Bombay. (Dacca Inter. 1940; Cal. Inter. 1938; Delhi U. Prep. 1950).

21. Discuss the importance of the following: (*a*) Tuticorin, (*b*) Colombo, (*c*) Ludhiana, (*d*) Kanpur, (*e*) Digboi, (*f*) Ahmedabad, and (*g*) Murshidabad. (Cal. Inter. 1940).

22. State briefly the present condition of the Indian paper industry. Name the indigenous raw materials used for manufacturing paper and mention where they are found. (Agra B. Com. 1951; Cal. Inter. 1942).

23. Describe the present position of Chemical Industry in India. In what direction is expansion possible in this industry? (Cal. B. Com. 1943).

24. Describe the changes that have taken place in recent years in the localisation of the ship-building industry of the world. What is India's share in this industry? (Cal. B. Com. 1943).

25. To what extent is the Indian Republic dependent on Pakistan for the supply of raw materials? Are there alternative sources available for such goods? (Delhi U. B.A. Hons. 1950).

26. Describe the nature of the present-day trade between India and U.S.A. How far do you think this trade admits of development? (Cal. B. Com. 1943; Delhi U. 1949; Delhi B. Com. 1952).

27. Analyse the nature and direction of U. K. trade with Indian Union. (W.B.C.S. 1949).

28. On an outline map of India indicate the Gondwana coal-fields and Tertiary coal-fields. Which of these is the most productive? What are the reasons of an acute shortage of coal in India in recent years? (B. Com. 1945).

29. Discuss the part played by the railways for commercial development of India. Do you think India should now pay more attention to the construction of roads and waterways than railways? (Cal. Inter. 1949).

30. Answer *any two* of the following :—

(*a*) How would you account for the fact that the silk industry has declined in Bengal, but continues to develop in Kashmir and Mysore?

(*b*) What geographical factors have determined the distribution of the woollen industry in India?

31. Analyse the geographical conditions suitable for the development of hydro-electric power. How far are these conditions in existence in India? (Cal. Inter. 1945; Cal. B. Com. 1948).

32. Name the two important fibres produced in India. Give an account of the conditions favourable for their large-scale production and their manufacture into finished products. (Cal. Inter. 1945).

33. "India is the leading Mica-producing country in the world, and is likely to remain so."—Examine the statement. (Cal. Inter. 1945).

34. Write short informative accounts of two of the following :— (*a*) Irrigation in India, (*b*) Sources of fish-supply in India, (*c*) Importance of sericulture in India's commerce. (Cal. Inter. 1945).

35. Give an account of the mineral resources of India and the extent to which they are utilised. (Agra B. Com. 1952).

36. Draw a sketch map of India indicating areas having a large raw cotton production and the more important places where cotton mills are located. Also comment on such localisation of the cotton industry. (C. U. Inter. 1946).

37. Is India rich in forest products? Mention the regions where these are available and their principal uses. (C. U. Inter. 1946).

38. Name the five important oil-seeds of India, describing the areas where they are produced and the uses to which they are put. (C. U. Inter. 1946).

39. On a sketch map of the Indian Republic, show the important regions of production of food grains. How is it that the shortage of foodstuffs is being felt in many parts of the country?
(Delhi B.A. Hons. 1950).

40. Does Calcutta possess advantages for being situated on the river Hooghly? Give an idea of the hinterland of this port and the principal articles of export and import. (C. U., Inter. 1946; W.B.C.S. 1949).

41. (*a*) The growth of Kanpur as an industrial centre in recent years has been phenomenal. State the causes. (C. U., Inter. 1946).

(*b*) Why was Jamshedpur selected by the Tata's for the location of their Steel Company? What subsidiary industries have been established there? (C. U., Inter. 1946).

42. (*a*) What are the essential conditions for the development of fishing industry? Do you think that Bengal and Assam possess such facilities? (C. U., Inter. 1946).

(*b*) Draw a sketch map of Indian Union, and indicate on it the principal air routes in operation within the country. Discuss possible lines of development, indicating the likely advantages to the nation.
(Delhi B.A. Com. 1949; W.B.C.S. 1949; Cal. B. Com. 1948).

43. Discuss the commercial importance of *any five* of the following :—

Kanpur, Vizagapatam, Nagpur, Jharia, Jubbulpore, Dibrugarh, Bangalore and Amritsar. (C. U., Inter. 1946).

44. Draw a sketch map of India and indicate the regions where mineral deposits occur. Also state briefly their principal uses.
(C. U., Inter. 1947).

45. Discuss the conditions favourable for the production of jute. Name the principal buyers of Indian jute and jute manufactures.
(C. U., Inter. 1947).

46. (*a*) Discuss the irrigation system of India. Also state what you know about the Damodar Valley Project.
(C. U., Inter. 1947; Delhi U. Hons. 1949).

(*b*) What do you understand by the term *multi-purpose project*? Mention the important projects under construction or consideration in Bihar and Orissa, and the advantages these provinces will derive from them. (Cal. B. Com. 1949; Delhi B.A. Hons. 1950).

47. You propose to go by rail from Amritsar to Jamshedpur *via* Delhi and Nagpur. State the Railway systems over which you will travel and the commercial importance of these places. (C. U., Inter. 1947).

48. Give an account of the part played by the river Ganges in the economic life of India. ((C. U., Inter. 1947).

49. India's sugar-industry is of recent growth. Mention the factors for its development and the provinces where mills are located.
(C. U., Inter. 1947).

50. Comment on the proposal of connecting Calcutta port with the sea by a ship canal. Mention the disadvantages of ship canal.
(Cal. B. Com. 1949).

51. What is meant by "coastal shipping"? Name the ports of importance in India's coastal trade and state the position of Indian shipping companies in the coastal trade of the country.
(Cal. B. Com. 1948).

52. "The concentration of coal-fields in one part of India is mainly responsible for the present location of industries in India." Do you agree? Give reasons. (Delhi B.A. Hons. 1950).

53. Account for the present geographical distribution of either the Indian cotton industry or the Indian iron and steel industry.
(I. I. B. 1948).

54. What do you know of the Bhakra-Nangal multi-purpose project? Discuss the economic advantages which East Punjab and Delhi are likely to derive from it when the project materialises. (Delhi B.A. Hons. 1951).

55. India is suffering both from the shortage of rice and jute. What would be your suggestions to increase the supply of both but not at the cost of each other? (Cal. B. Com. 1951).

56. Discuss how far the forces of economic geography have influenced the railway route pattern of India. (Delhi B. Com. 1952).

57. What are the characteristic features of the foreign trade of India? What changes have taken place in the items of our exports and imports after partition? (Cal. Inter. 1951; Agra B. Com. 1951).

CHAPTER XVII

DOMINION OF PAKISTAN

The Dominion of Pakistan, until 14th August, 1947, a portion of India, was created because of the demand of the majority of the Muslims of India for a separate State.

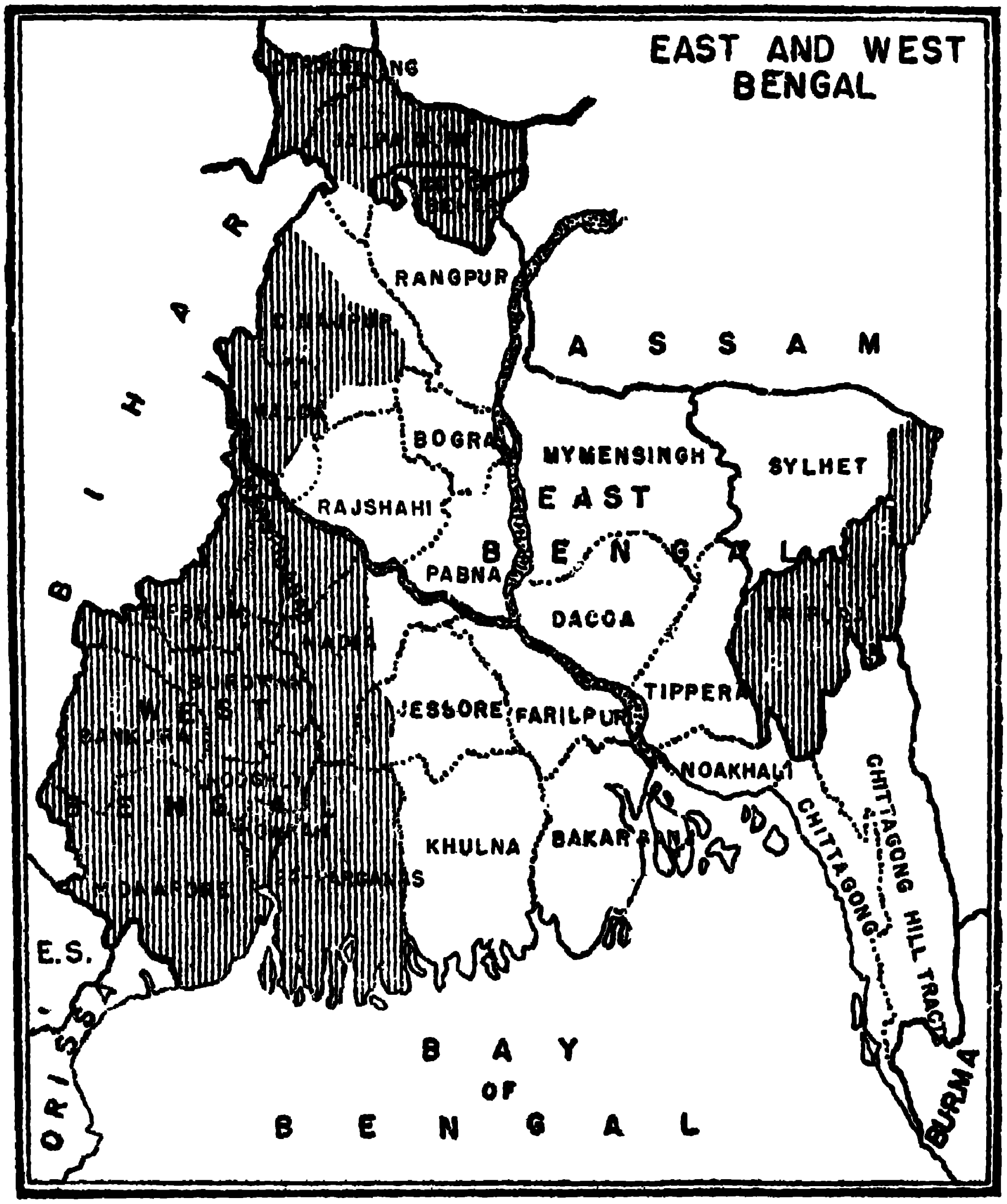

FIG. No. 152. Map showing the division of Bengal. The Eastern Pakistan comprises East Bengal and Sylhet.

The Dominion consists of two disproportionate regions—the smaller comprises the Eastern Pakistan, the larger is the Western Pakistan. The Eastern Pakistan is an *'island'* in the Indian Union and is separated from Western Pakistan by about 1,500 miles.

AREA AND SIZE

The total area of Pakistan is 360,780 square miles and it is made up of four provinces of West Punjab, East Bengal, Sind and N.W.F.P., as well as Baluchistan and the States. The three provinces of West Punjab, Sind and N.W.F.P., as well as Baluchistan and the States constitute the *Western Pakistan,* while the greaer part of undivided Bengal, including East Bengal, and Sylhet form the *Eastern Pakistan.* The Eastern Pakistan is about one-sixth of the total area of the Western Pakistan.

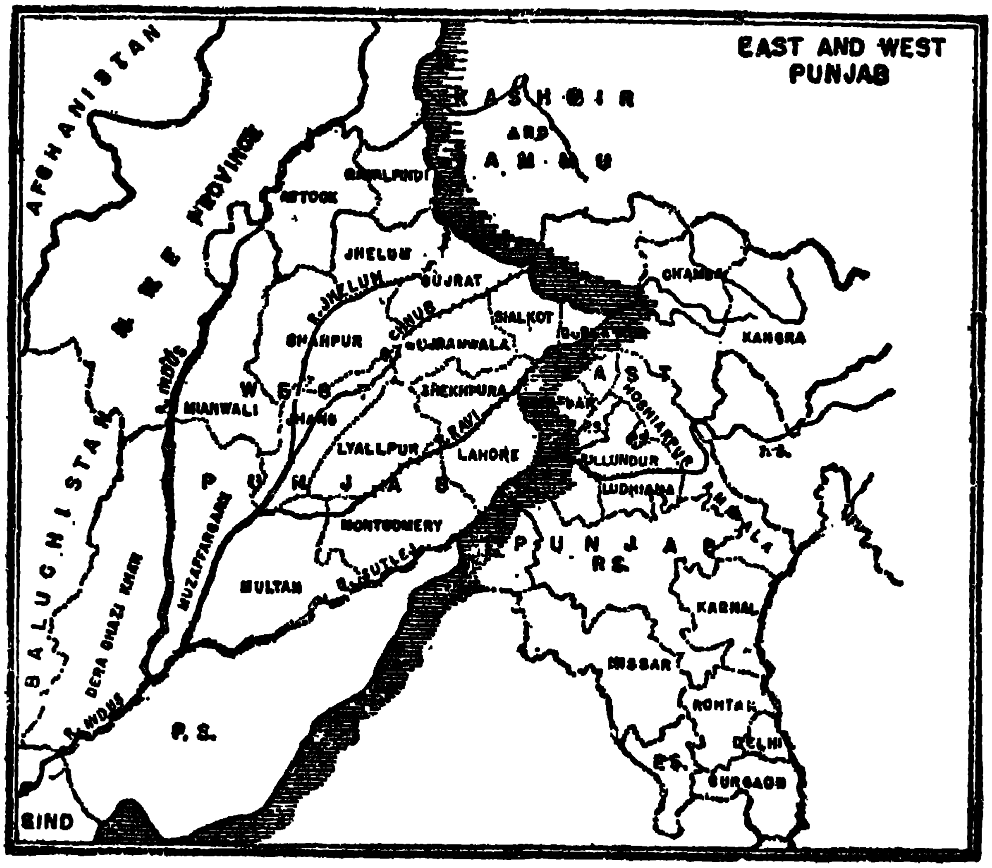

FIG. NO. 153. Map showing the division of the Punjab into West Punjab and East Punjab.

Provinces	Area in square miles
(a) *Eastern Pakistan*:	
East Bengal	49,270
Sylhet district	4,650
(b) *West Pakistan*:	
West Punjab	62,000
Sind	48,100
N. W. F. P.	14,260
Baluchistan	54,460
Bahawalpur State	17,500
Baluchistan States	79,500
Khairpur States	6,000
N. W. F. P. States	25,000
	360,780

The area of the country is a little less than that of Burma and is roughly equivalent to that of the United Kingdom and France combined.

Pakistan has a long coastline with a variety of interesting features. The Bay of Bengal is indented by a series of shallow channels and bays while along the Arabian Sea side, the coastline is relatively smooth.

Population

According to 1941 census, the total population of Pakistan is 70·33 million, and of these some 67 million live in the provinces. Because of the annual increase in population as well as large influx from the Indian Union, population must be now over 75 million. The average density of population is 195 per square mile, but its distribution is very uneven as more than 792 people per square mile live in East Bengal while it is 6 in Baluchistan. More than 73 per cent. of the population are Muslims. Out of the total population of Bengal, 35·14 per cent. are in West Bengal and 64·86 per cent. in East Bengal. The percentage of Muslims in West Bengal to its total population is 25·01. Similarly, the percentage of non-Muslims in East Bengal to the total population of that province is 29·17.

The distribution of population by provinces is as follows.*

Western Pakistan	In millions	Eastern Pakistan	In millions
West Punjab	15·80	East Bengal	39·7
Sind	4·53	Sylhet	3·0
N.W.F.P.	3·04		
Baluchistan	·50		
Tribal areas	2·38		
Bahawalpur	1·34		
Other States	·67		

The Dominion is now the fifth largest country in the world in point of population, being preceded by China, Indian Union, U.S.S.R. and U.S.A.

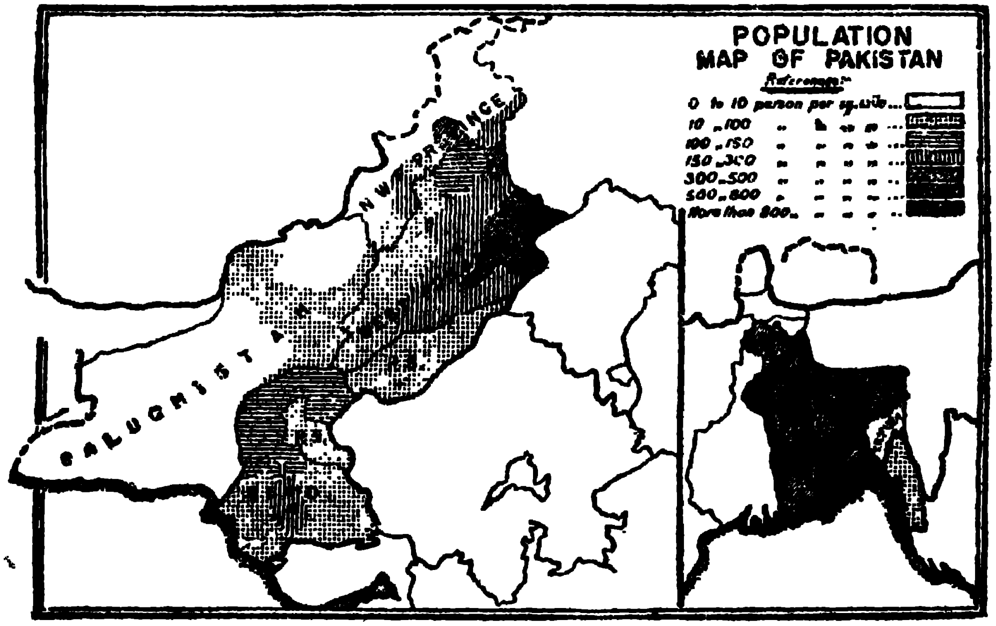

FIG. No. 154. Note the great concentration of population in the eastern part of Eastern Pakistan as well as in the canal colonies in West Punjab.

About 90 per cent. of the population live in villages as against 86 per cent. in the case of the Indian Union.

In Pakistan, the languages are Bengali (for the whole of East Bengal), Urdu (the State language of Pakistan), Sindhi (for Sind) and Pushtu (for N.W.F.P.).

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* According to the last census, the total population on March, 1951 in Pakistan was 75·6 million (42 million in East Bengal, Punjab 20·6 million, N.W.F.P. 5·7 million, Sind 4·1 million).

Natural Regions

From a geographical aspect, Pakistan may be divided into six regions.

Western Pakistan .. (1) Dry Plateau.
(2) North Western Dry Hills Regions.
(3) Arid Plains.
(4) Deserts.
Eastern Pakistan .. (5) Wet Lowlands or New Delta Region.
(6) Ganges-Brahmaputra Doab.

(1) The whole of Baluchistan is a dry plateau and lies outside the influence of the monsoon. The climate is subject to extreme heat and cold with rainfall, uncertain and scanty. Due to lack of water, only a small fraction of the country is under cultivation by means of "Karez" irrigation or by flood waters from the rivers. The principal crops are millets, wheat and

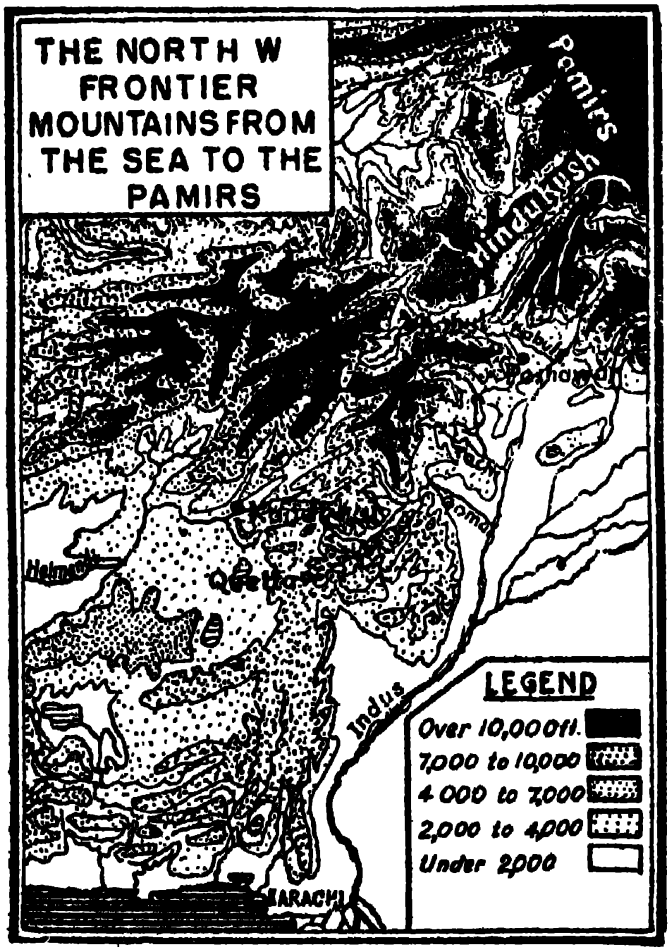
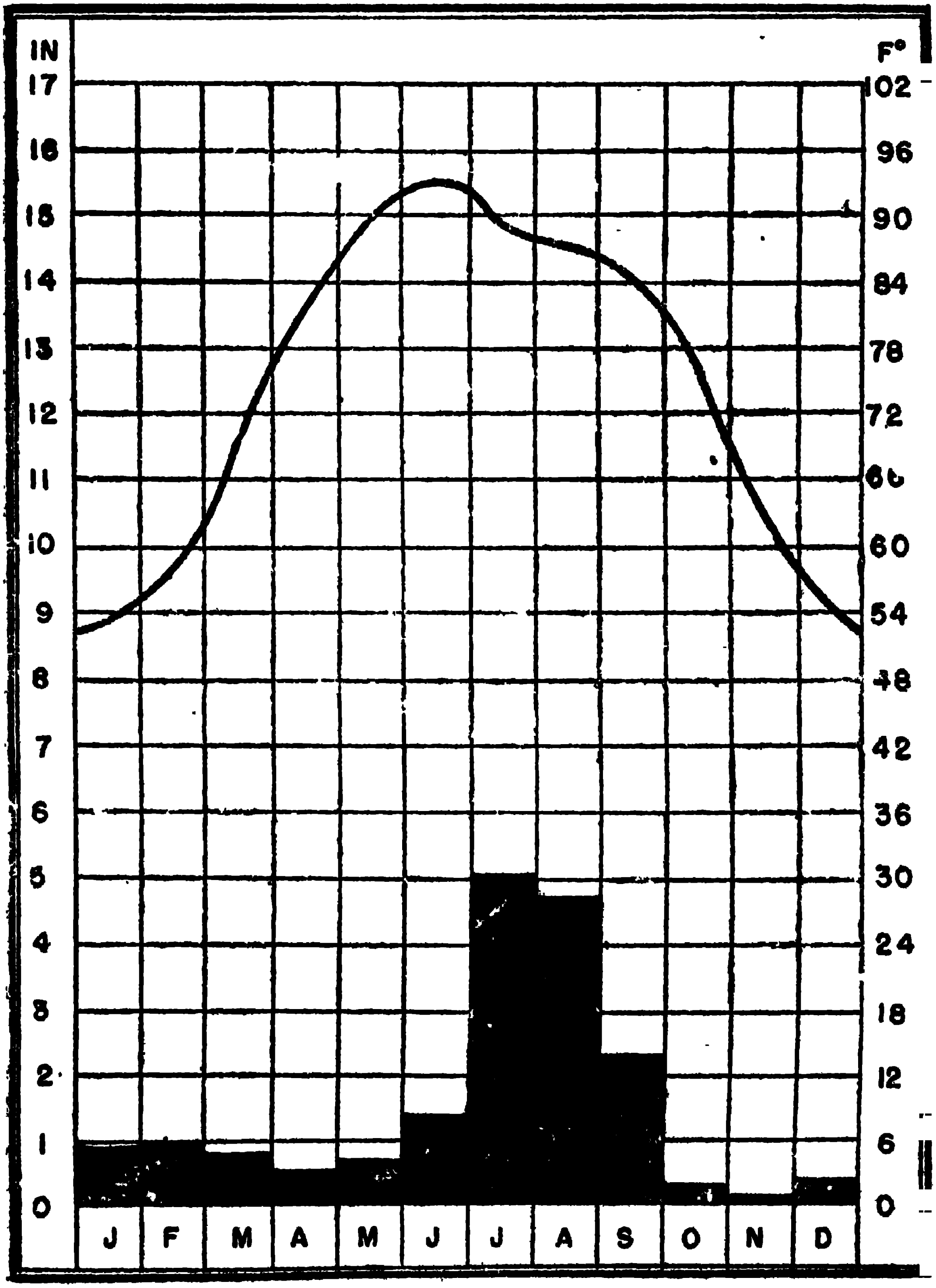


FIG. NO. 155.

fodder. There is very little surplus and whatever there may be cannot easily be exported on account of the difficulties of transport. Fruits are extensively grown. Grapes, apricots, peaches, apples, pears and melons are exported.



*LAHORE

FIG. No. 156.

(2) The North West Frontier Province and the adjoining districts of the Western Pakistan belong to the Dry Hills Regions. The rainfall nowhere exceeds 20 inches. Irrigation has been developed in the valley of Peshawar and the Bannu plain where the population is the thickest. The region is outside the influence of the monsoon and most of the scanty rain falls in the cold season. The soil and climate are generally unsuited to the growth of large trees, but adapted to scrub jungle of a drought-resisting type. The important crops are wheat, gram and millets.

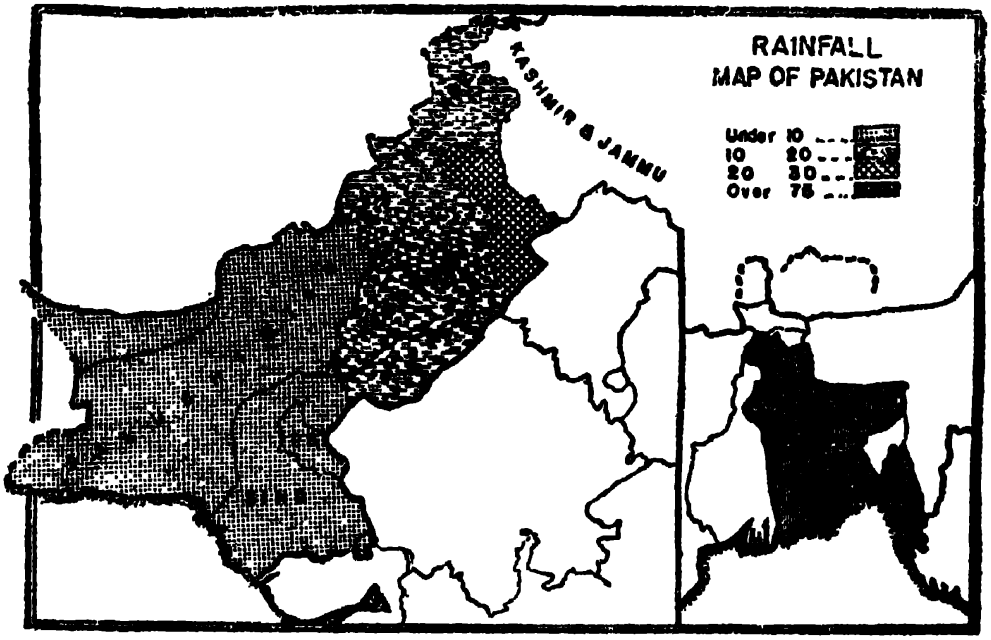


FIG. No. 157. Except in and near the N.W.F.P., the West Pakistan is a zone of very low rainfall: The greater part of the farming depends on irrigation. East Bengal is an area of very heavy rainfall, the overall annual average being over 75 inches.

(3) The plain encompasses the valleys of the Indus and its tributaries and covers the whole north-eastern and south-western and the southern portions of the Western Pakistan. The plain is drained by the five rivers Jhelum, Chenub, Sutlej, Ravi and Bias—all of which join the Indus. The north-eastern plain is damper and grows crops without irrigation. The rainfall is between 10/20 inches. The western plain is very dry and all crops are dependent on irrigation.

The southern portion is a dry alluvial plain stretching from the edge of the Baluchistan plateau to the Thar desert on the east. Agriculture is developed with irrigation along the Indus Basin. The rainfall is less than 10 inches.

(4) The desert covers the south of the Sutlej and the eastern portion of Sind. The region is, really speaking, the Western part of the *Thar* desert. The rainfall is less than 5″ a year.

(5) East Bengal is a new deltaic region. Every year huge quantities of silt are brought down by the rivers. During the monsoon period, a great part of the region is flooded, and a rich deposit of silt is spread over the country. This region is a land of rivers, and there are few roads. The rivers thread their way across the region and eventually flow towards the Bay of Bengal.

The rainfall is more than 75 inches everywhere, and soil is very fertile. Rice, sugar-cane and jute are the principal crops. The climate of East Bengal is sub-tropical with a high humidity.

(6) North Bengal is really a portion of the Ganges-Brahmaputra Doab. The surface is usually flat, broken here and there by low hills.

Irrigation

Pakistan with her 30 million acres of irrigated land occupies the second position in the world in respect of canal irrigation. The importance of irrigation in the case of Western Pakistan can hardly be exaggerated. In the Western Pakistan, the rainfall is not only uncertain but also varies from year to year The rainfall is under 10 inches in the whole of Sind and Baluchistan, while it is between 10 and 20 inches in West Punjab and the N.W.F.P. Only the extreme eastern part of West Punjab receives more than 20 inches rainfall.

"One year in five may be expected to be a dry year, and one in ten a year of severe drought." The Western Pakistan, therefore, depends, to a great extent, for cultivation on the irrigation works. About 34 per cent. of the cultivated area of Pakistan is irrigated compared to 18 per cent. in the Indian Union.

The Western Punjab is a canal colony because the conditions are excellent for developing irrigation. The Indus and its tributaries spread out over the province like the fingers of an open hand. With the exception of the North-West, the province is flat with soft alluvial soil. The development of canal irrigation has transformed the Lyallpur and Montgomery districts which were more or less like semi-deserts, into fertile agricultural lands. About 14 million acres of land are irrigated by canals in Western Punjab.

(*a*) The largest irrigation work is the Lower Chenub Canal. It has 2,437 miles of channels and irrigates more than 2 million acres of land of the Lyallpur colony. It takes its water from the Chenub at Khamki and has turned a semi-desert tract into a rich agricultural area around Lyallpur, where population has increased with great rapidity after the opening of the canal system. Before its construction, the density of population in this area was very sparse and never exceeded 10 people per square mile. At present there are more than 300 people per square mile. In winter months, the Chenub is dry below Khamki. The percolation of water, however, into the Chenub below the headwork is considerable and there is appreciable supply of water at the junction of the Chenub and the Jhelum.

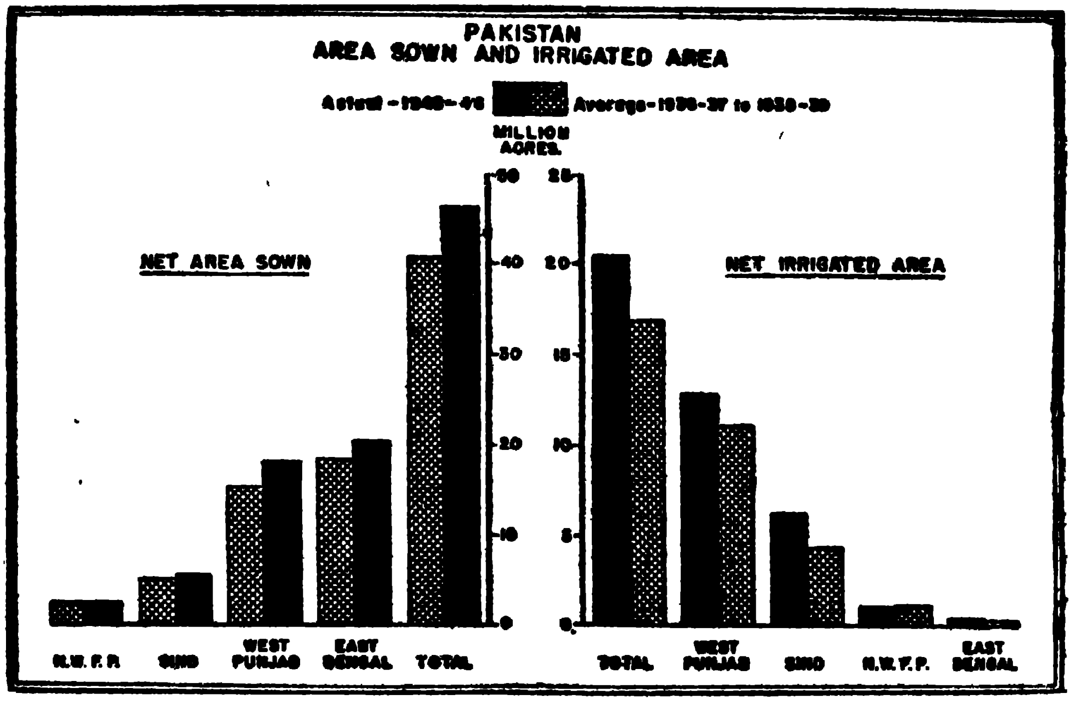


FIG. No. 158. Note the importance of irrigation in the West Punjab and Sind.

(*b*) The Lower Jhelum Canal has 583 miles of channels and irrigates more than 8,60,000 acres of land of the Shahpur Colony in West Punjab. The head-stream is at Rasul on the border of Kashmir State. In winter months the Jhelum is almost dry below Rasul.

(c) The Upper Jhelum Canal takes its water from the Jhelum at Mangla in Kashmir and irrigates Gujarat lying between the Upper Jhelum and the Upper Chenub. The canal was opened in 1915.

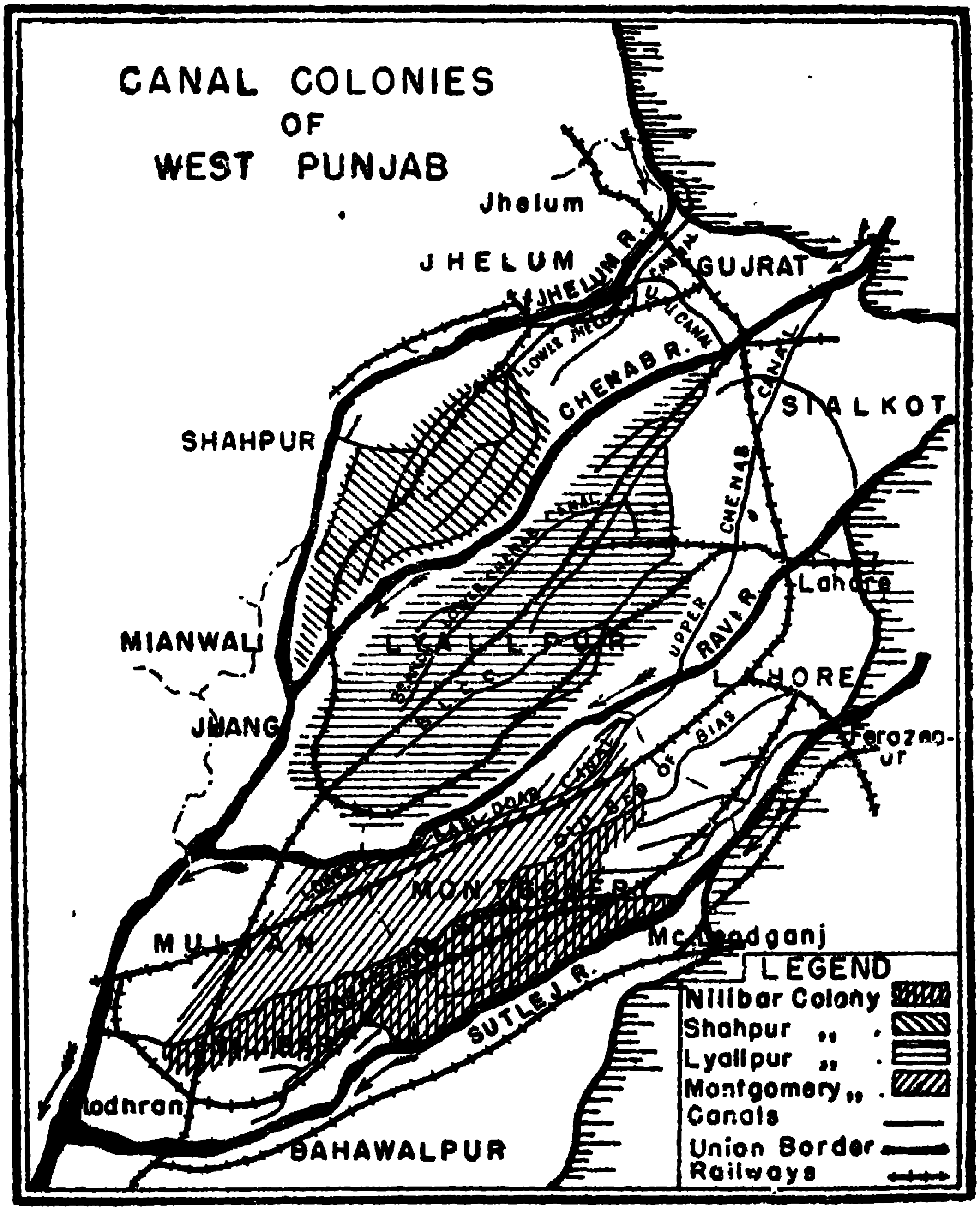


Fig. No. 159. The amount of water available varies from canal to canal and is limited by the water supplies of the rivers from which the canals off-take. The water of the Jhelum river can be switched into the Chenub *via* Upper Jhelum feeder and the water of the Chenub can be switched into Ravi *via* the Upper Chenub feeder. The Lower Bari Doab Canal, although taking out of the Ravi, is entirely dependent on the Chenub for its supplies. It may be mentioned in this connection that the head-works of the U.J.C., U.C.C., U.B.D.C., and the Sutlej system are in the Indian Union.

(*d*) The Upper Chenub Canal takes its water from the Chenub at Marala in Kashmir and joins the Lower Bari Doab Canal at Balloki on the Ravi. The canal was opened in 1912. The canal serves Sialkot, Gujranwalla and Sheikhpura.

(*c*) The Upper Bari Doab Canal which has its headworks at Madhopur and passes through Amritsar district in the Indian Union, also irrigates Lahore and Montgomery districts. This canal was one of the oldest and most important in the undivided Punjab.

Most of the head-streams as well as the sources of the Punjab canals are in the East Punjab or Kashmir.

Mention may be made of the *Triple Canal Project*—a magnificent engineering work. The lower Bari-Doab Canal does not possess sufficient water, because the Upper Bari-Doab Canal in East Punjab takes away much water from the Ravi at Madhopur. The Upper Chenub Canal has, therefore, been connected with the Lower Bari-Doab Canal at Balloki. Again, owing to the existence of the Upper Chenub Canal, the Lower Chenub Canal does not possess sufficient water. By a bold engineering conception, the Upper Jhelum has now been connected with the Lower Chenub at Khamki. The entire project was completed in 1933.

In Bahawalpur State, there are three canals, namely, the Bahawal Canal, the Fordwan Canal and Sadiquia Canal—all taking off from the Sutlej. In Bahawalpur an irrigation scheme is being implemented which will bring 260,000 acres of land under cultivation very soon.

An area of nearly six million acres, that is, more than 74 per cent. of the total area sown in Sind is irrigated by canals. The Lloyd Barrage Scheme is one of the marvels of engineering science. A great dam has been constructed across the Indus river by putting a barrage at Sukkur in order to control the waters of the river ; from the dam, water is distributed by means of canals to different areas of Sind. The total length of the canals which have been drawn from the Lloyd Barrage is about 74,000 miles. The upper Sind which is not served by the Lloyd Barrage System has three canal works—(*a*) the Desert Canal, (*b*) the Begari Canal and (*c*) the Unhar Wah Canal. The Lower Sind has two canals —(*a*) Karachi Canal and (*b*) Fuleli Canal.

In N.W.F.P. about 400,000 acres of land are now being irrigated by canals which take off from the Swat. The upper Swat

System was opened in 1914 and now serves about 70 per cent. of the irrigated area of the province. There is a great scope for further development of canal irrigation in the Western Pakistan. Four irrigation projects are already being worked out—two in the West Punjab and two in Sind. Besides, the Government has planned two multipurpose projects—one at Warsak in the N.W.F.P. and the other at Rasul in West Punjab. All these projects will make available a further twelve million acres of land for cultivation.

The Warsak Multipurpose Project of the North-West Frontier Province will develop 100,000 Kw. of energy and provide facilities for irrigation to 60,000 acres of lând in the Peshawar district and several thousand acres in the Tribal areas, including a portion of the Khajuri plain, outside Jamrud. The project will enable the Kohat Valley to construct tube-wells for irrigation. The Warsak will supply power for working the Mullagori marble mines, four miles from Warsak dam, coal deposits in the Cheral hills near Peshawar and in the Kohat district, gypsum in Kohat, copper ore in the Mohmand country and subsidiary industries. It will also provide, by means of canal navigation, communication between N.W.F.P. and West Punjab.

Wells are being introduced for irrigation in the Western Punjab. Small power-pumps are used in well-irrigation, particularly in the districts of Lyallpur, Jhang, Sheikhupura and Sargodha. Mention may be made of "Karez", an underground system of irrigation which is extensively practised in Baluchistan. Here the soil is open and porous and is composed of water-worn stones ; but below the surface the soil is hard, impermeable and conglomerated. Therefore, water is found flowing in many places below 20 or 30 feet from the surface, although on the surface itself there is no water. The water thus found is led gradually towards the surface through the Karez. A series of wells are dug at intervals of 15 to 25 yards, and connected below by an underground passage, through which the water runs till at last it reaches the surface and is utilised for irrigating the fields.

Agriculture

Agriculture is the most important industry in Pakistan, as more than nine-tenths of the population depend on it for their living. Agriculturally, six zones can be distinguished in Pakistan: (*a*) Sub-Montane—N.W.F.P., (*b*) North-eastern plains of Western Punjab, Gujarat and Sialkot, (*c*) North-West Punjab—Rawalpindi, Jhelum, Attock, Mianwali, Peshawar, Kohat and Bannu, (*d*) South-western plains of the Western Punjab—Gujranwalla, Lahore, Lyallpur, Montgomery, Multan, Bahawalpur, Dera Ghazi Khan and Dera Ismail Khan, (*e*) Lower Sind, (*f*) East Bengal. Out of 150 million acres of land in Pakistan, about 54 million acres are at present cultivated, the remaining acres being uncultivated.

The principal crops are wheat, rice, maize, sugar-cane, tea, jute, cotton, oil-seeds and tobacco. "Pakistan is an agricultural surplus area which can feed its own people, export some wheat and a great deal of cotton and jute."

The great mass of the population are engaged in agriculture. A scheme is being drawn up for the mechanisation of cultivation in the Dominion on a co-operative basis. This will improve the lot of the farmers and increase the output. Mechanised cultivation has already begun in certain areas of West Punjab. In Baluchistan, mechanised cultivation will be concentrated on fruit cultivation. Mechanisation of agriculture will not be necessary in Sind as the completion of the lower and upper Sind barrage will automatically increase cultivation in the province. The Chengri Valley of the Chittagong Hill tracts is being developed for mechanised cultivation. At present the delta region of the Eastern Province of Pakistan is full of diseases and lying almost uncultivated. This region will soon be brought under cultivation with the help of modern farming methods through the efforts of the World Health Organisation and the Food and Agricultural Organisation.

Food crops occupy about 85 per cent. of the total cultivated area of Pakistan.. About half of this area is in Eastern Pakistan. Pakistan does not require any more expansion in the food crop cultivation but she requires a switch over from food crops to cash crops which will command greater economic value both at home and abroad.

The total area under foodgrains in Pakistan is normally about 35 million acres with a production of about 12 million tons. Of this, about 23 million acres are under rice with a production of nearly 8 million tons and 10 million acres under wheat with an aggregate output of 3 million tons. The remaining acreage is under maize, millets and barley. Thus taking all foodgrains together and after providing for seeds, wastage and farm stocks, Pakistan has a surplus of 4 lakh to 5 lakh tons of foodgrains in a normal year.

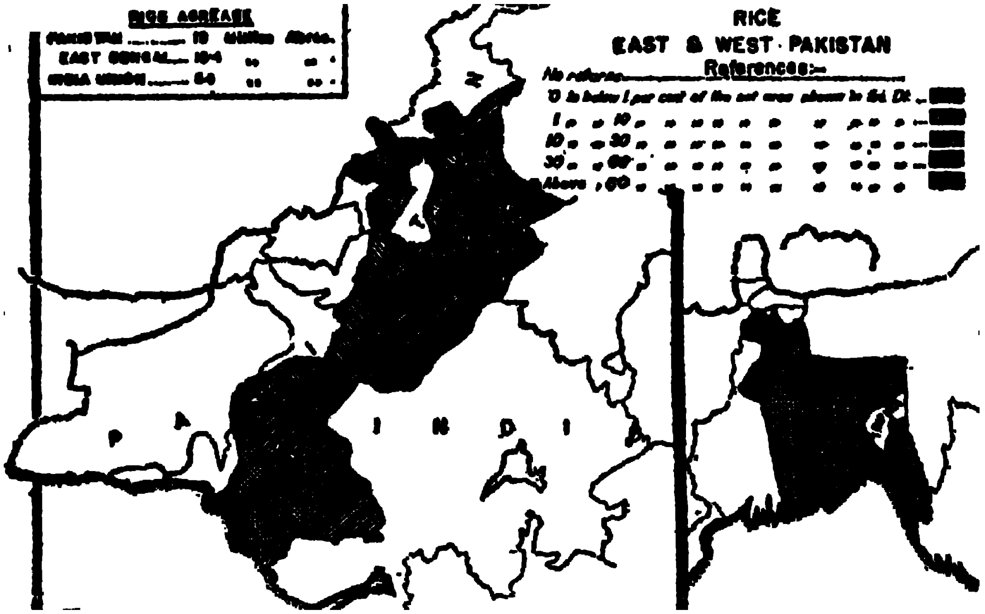


FIG. No. 160. Note the great concentration of cultivation in East Bengal where more than 60 per cent. of the sown area accounts for rice.

YIELD AND AREA UNDER FOOD CROPS*

	1948-49 Area (000 acres)	1948-49 Yield (000 tons)	1949-50 Area (000 acres)
Rice	21,545	8,429	20,745
Wheat	10,824	4,103	10,824
Jowar	1,092	213	1,164
Bajra	2,299	373	2,439
Maize	965	412	991
Barley	611	179	678
Gram	2,919	800	2,919
Sugarcane	714	1,019	724
Edible oil seeds ...	1,530	265	1,530

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* Source: *Basic Facts about Pakistan*, 1951.

Rice : It is the staple food of the people of Eastern Pakistan. About 22 million acres of land are under rice, of which East Bengal alone possesses 20 million acres. Sind and Sylhet have 3 million acres in total under rice, while West Punjab has little above half million acres. In every district of Eastern Pakistan rice accounts for more than 60 per cent. of the sown area.

Pakistan raises 8·4 million tons of rice annually to which Eastern Pakistan contributes 7·0 million tons. Normally the Eastern Pakistan is a deficit area in rice, and the deficit is met by supplies of rice from the Western Pakistan.

There are now 84 rice mills in Pakistan, all of which are located in East Bengal.

Wheat : It occupies 10 million acres of land and gives a yield of 4 million tons a year. It is mostly grown in the West Punjab, Sind and N.W.F.P.

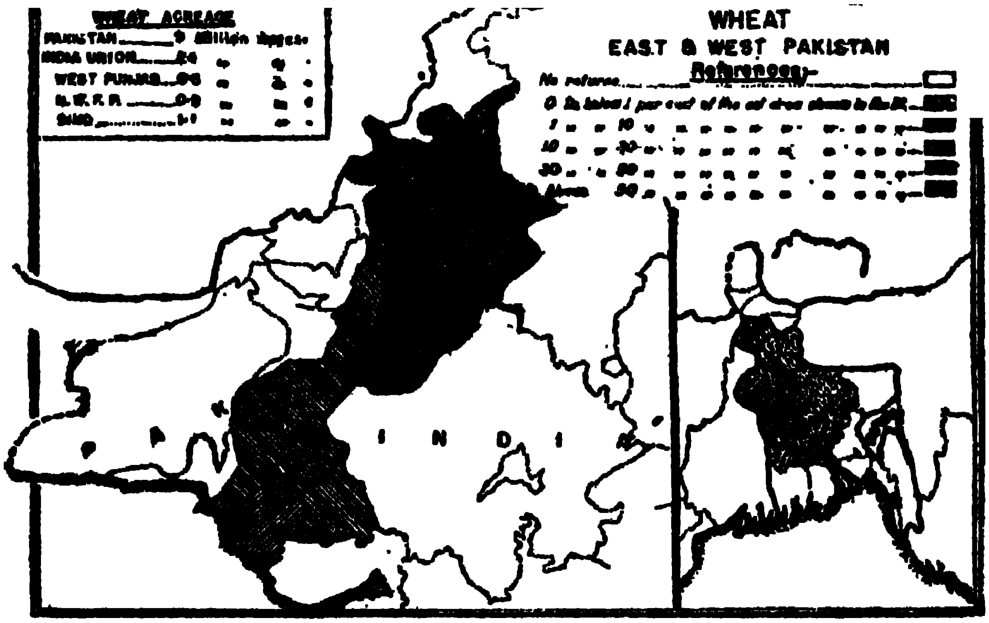

FIG. No. 161. In West Punjab, every district has more than 30 per cent. of the sown area under wheat.

WHEAT AREAS IN 1946-47

Areas	(In 000 acres)	Areas	(In 000 acres)
West Punjab	.. 7,192	Sind ..	.. 1,248
N.W.F.P. ..	.. 1,087	States ..	.. 819

Wheat is cultivated in Western Pakistan in the months of November and December and is harvested in May. The average yield of wheat per acre in the West Punjab is 700 pounds and in Sind 600 pounds. The districts of Muzaffar Garh, Attock, Jhelum and Sialkot in the West Punjab have each between 50-60 per cent. of the net cultivated area under wheat. In Eastern Pakistan the monsoon discourages wheat cultivation although in small quantities it is raised in Rajshahi, Pabna and Kusthia. The Western Pakistan is a surplus area in wheat and has, therefore, an exportable surplus.

A little quantity of *barley* is also grown in Pakistan, most of which comes from the N.W.F.P. The districts of Mardan and Peshawar grow nearly half the total provincial area under barley. Barley occupies about 157,000 acres in the N.W.F.P. The other food crops of Pakistan are *Maize, Pulses* and *Gram*. Maize is extensively grown in the West Punjab and N.W.F.P.

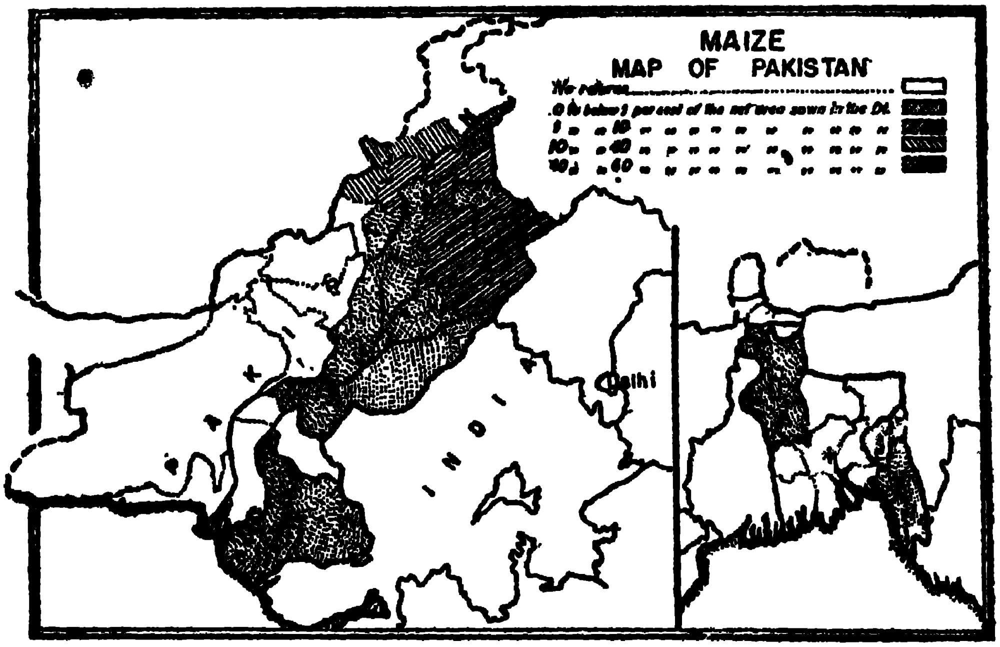

FIG. No. 162. The central region of the N.W.F.P. and the northern area of West Punjab have the greatest acreage under maize.

In 1945-46, about 1 million acres of land were under maize in Pakistan. West Punjab and Sind share equally in acreage. The annual average production is about 400,000 tons.

In West Punjab, the districts of Rawalpindi, Attock, Jhelum and Gujarat have the largest acreage under maize.

Recently, the acreage under maize has also increased in Sheikhpura, Sialkot and Gujranwalla. In Sind, maize-producing districts are Sukkur and Hyderabad.

Gram covers approximately 3 million acres, of which 98 per cent. is in West Punjab. Small quantities are also raised in Sind, North West Frontier Province and East Bengal. The Dominion produced 626,000 tons of gram in 1945-46. Although gram is cultivated in almost every district of West Punjab, the largest acreage under this crop is found in Shahpur, Montgomery and Multan.

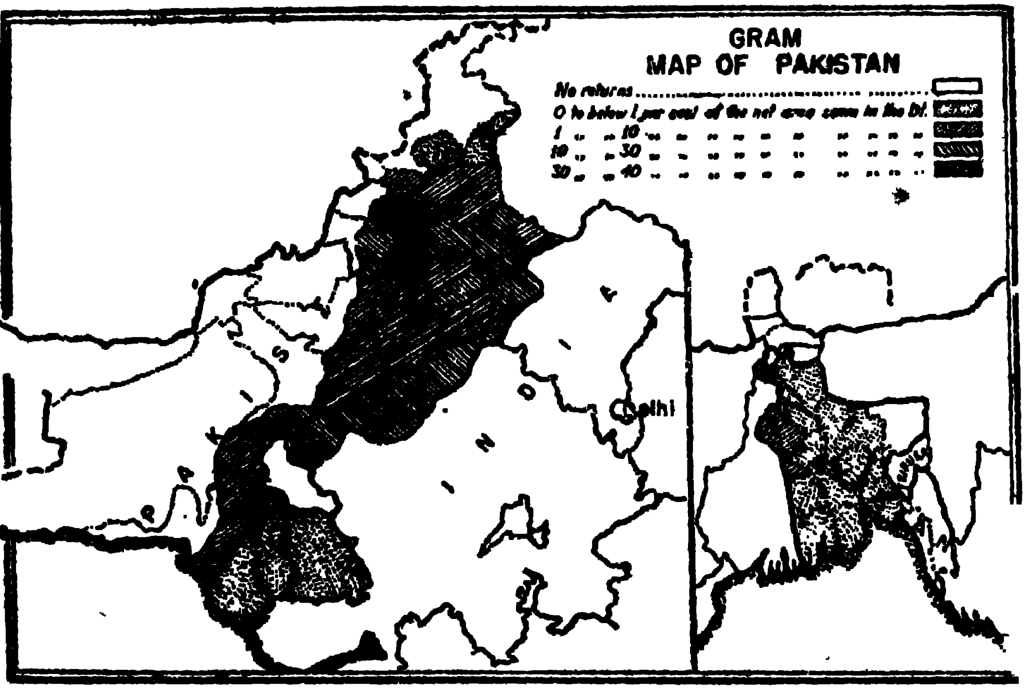

FIG. No. 163. The cultivation is confined to the valleys of the Indus and its tributaries.

GRAM AREA IN PAKISTAN

(Thousand acres)

Provinces/States	Average 1936-37 to 1938-39	1944-45	1945-4
East Bengal	101	283	221
N.W.F.P.	155	236	216
Sind	335	403	454
West Punjab	1,022	1,887	2,034
Total (Pakistan Provinces)	1,613	2,809	2,925
Khairpur	20	30	22
Total Pakistan	1,633	2,839	2,947

The position of Pakistan in the matter of foodgrains is on the whole satisfactory. There is a large surplus of wheat and small surplus of rice in the Western Pakistan. Thus the deficit of food in Eastern Pakistan can be met by the Western Pakistan. With improved agricultural methods, extended irrigation, more capital and better communications, the Western Pakistan would be able to support a population larger than its present size.

Sugar-cane is cultivated in an area of 700,000 acres of land in Pakistan. The cultivation is mostly confined to the Western Punjab and Eastern Bengal. The sugar-cane tracts of the Western Punjab are Montgomery, Lyallpur, Sialkot and Lahore. In Eastern Bengal the producing districts are Dinajpur, Rangpur, Dacca and Mymensingh. The total production of sugar is only 25,000 tons. The Dominion will have to depend for many more years on the imported sugar from the Indian Union.

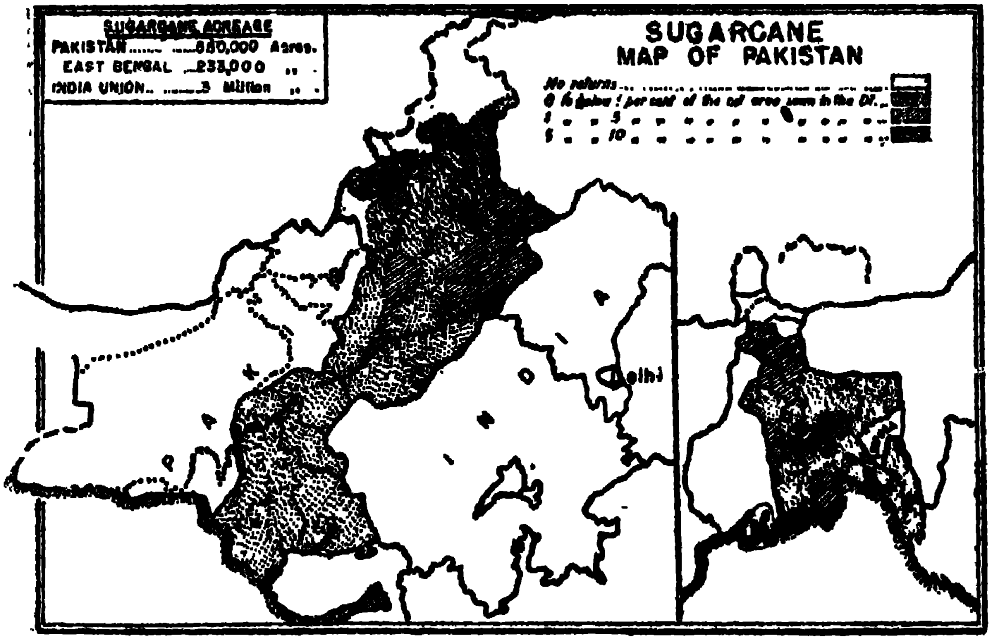
SUGARCANE ACREAGE
PAKISTAN .... 660,000 Acres.
EAST BENGAL ... 233,000 ,,
INDIA UNION .... 3 Million ,,
SUGARCANE
MAP OF PAKISTAN
No returns
0 to below 1 per cent of the cul area sown in the Dt.
1 .. .. 5 .. ..
5 .. .. 10 .. ..
Delhi

FIG. No. 164. Note the great concentration of sugar cultivation in N.W.F.P., canal colonies in the West Punjab and Mymensingh in East Bengal.

SUGARCANE-AREA IN PAKISTAN

(*Thousand acres*)

Provinces / States	Average 1936-37 to 1938-39	1944-45	1945-46
East Bengal	256	254	259
N.W.F.P.	64	96	95
Sind	7	6	5
West Punjab	194	251	261
Total Pakistan	521	607	620

In 1948-49, Pakistan had 714,000 acres of land under sugarcane cultivation.

Tobacco : Tobacco is an important cash crop of Pakistan. It is mostly grown in East Bengal. The chief districts are Rangpur, Dinajpur and Chittagong. About 15 per cent. of the sown area in Rangpur is occupied by tobacco.

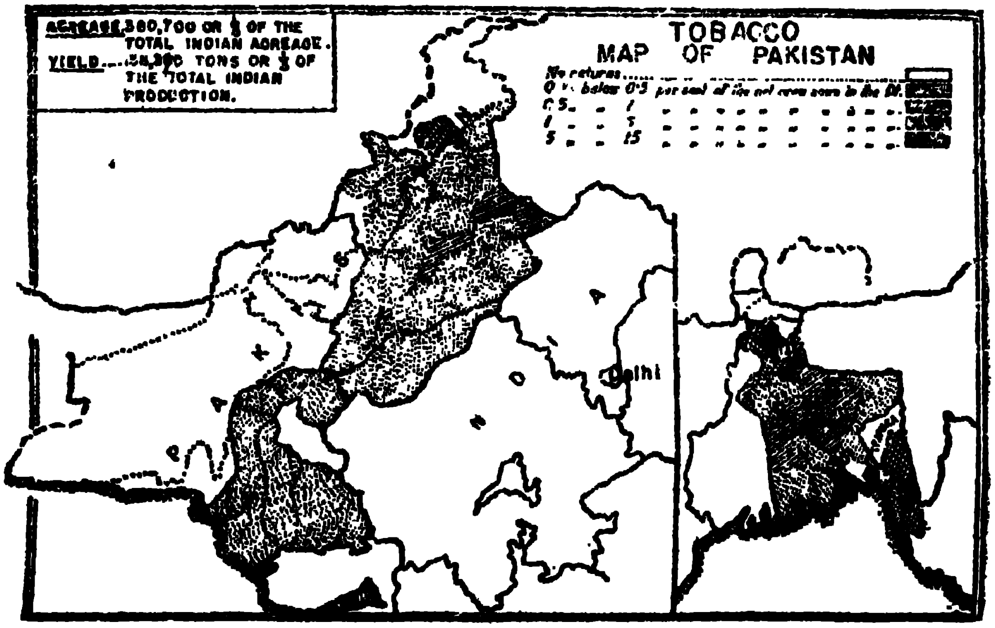
ACREAGE 380,700 OR ⅓ OF THE TOTAL INDIAN ACREAGE.
YIELD ... TONS OR ⅓ OF THE TOTAL INDIAN PRODUCTION.
TOBACCO MAP OF PAKISTAN
No returns
0 % below 0·5 per cent of the net area sown in the Dt.
0.5 – 1
1 – 5
5 – 15
Delhi

FIG. No. 165. Note that Rangpur in Eastern Pakistan and Sialkot in the West Punjab are the two important tobacco-producing districts.

AREA AND PRODUCTION (AVERAGE 1936-1939)

	Thousand acres	Thousand tons
East Bengal	279	118
West Punjab	48	18
N.W.F.P.	18	11
Sind	5	2
States	1	1
Total ...	351	150

The area under tobacco in 1947-48 was 326,000 acres and the production 140,000 tons.

Tea : It is also an important product in Pakistan. Its cultivation is confined to Sylhet and Chittagong hill-tracts. The annual production of tea is about 45 million lbs. compared with 405 million lbs. in the Indian Union. At present there are 116 factories in Eastern Pakistan, of which 109 are in Sylhet and 3 in Chittagong. About 74,112 acres of land are under tea cultivation in Pakistan. Tea is chiefly exported to U. K. Pakistan had joined the international tea agreement early in 1949 for a period of two years. Pakistan's standard acreage under the agreement is fixed at 76,700 acres, and the export quota at nearly 35 million lbs.

Pakistan exports about 50 million lbs. of tea yearly. The United Kingdom, which is one of the best customers of Pakistan tea, imported 28 million lbs. of tea in 1948-49.

Tea is mainly exported through Chittagong. As the export seasons of jute and tea are the same, there is always a great rush for loading at Chittagong; consequently Chittagong with its normal capacity of only 600,000 tons per annum cannot cope with the traffic. Another problem of the tea industry is the shortage of tea chests.

AREA UNDER TEA IN PAKISTAN

(Thousand acres)

Provinces / States	Average 1936 to 1938	1940	1943	1945
East Bengal ...	56,342	63,019	76,771	73,330
Total Pakistan ...	56,342	63,019	76,771	73,330

In 1949-50 tea production was 39 million lbs. in Pakistan.

Cotton : It is the most important industrial crop of Western Pakistan, although produced in every part of the Dominion.

Thus Western Pakistan raises about 97 per cent. of the Dominion's cotton. Multan, Montgomery, Lyallpur, Shahpur, Lahore, Sheikhpura and Jhang districts account for 90 per cent. of the cotton production of West Punjab. In each of these districts cotton occupies 20 to 30 per cent. of the sown area.

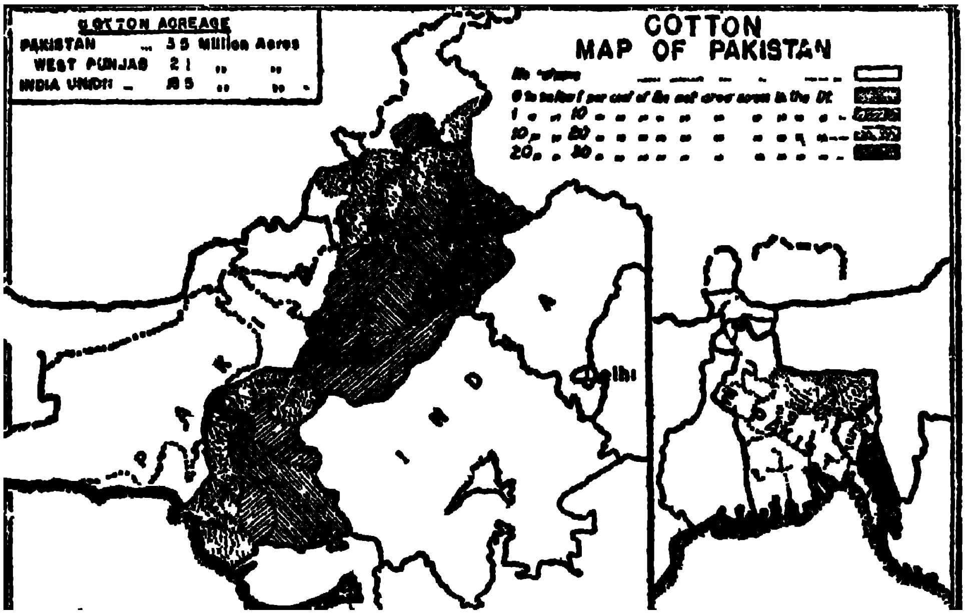

FIG. No 166 Note the greater concentration in the eastern parts of West Punjab and Hyderabad District in Sind.

COTTON: AREA AND PRODUCTION (1945-46)

	Thousand acres	Thousand bales of 400 lbs. each
West Punjab	1958	810
Sind	826	382
States	435	194
N. W. F. P.	9	2
East Bengal	91	23
Total ...	3319	1411

Recently both production and acreage have considerably declined. In 1948-49, acreage was 28·5 lakhs and production about 10·5 lakh bales. The lower production is due to decline in exports of raw cotton. Indifferent quality and high prices are at present responsible for this decline. With a view to encouraging the export of cotton, the Government lowered the export duty on short-stapled cotton.

Sind has cotton tracts in the districts of Tharparkar, Hyderabad and Nawabshah which contribute about 95 per cent. of total provincial production.

Of late, American cotton has been raised in the West Punjab and Sind, which are watered by a perennial canal system and where the climate has plentiful moisture. Such plants need about 7 months of growing season during which time there must be no risk of frost. At present the American varieties account for 80 per cent. of the total production. About four million acres of land are under cotton cultivation in Pakistan and the yield is 1·3 million bales (of 400 lbs. each). American cotton occupies about 75 per cent. of the total acreage. Pakistan is in a position to export about 80 per cent. of her cotton mainly to the Indian Union.

Jute : Pakistan holds a dominant position as a producer of raw jute. About 80 per cent. of the total world production of jute comes from the Eastern Bengal. In 1949-50, a little more than 1·5 million acres of land were under jute cultivation in Pakistan.

PAKISTAN *vis-a-vis* WORLD PRODUCTION OF JUTE

(In 000 metric tons)

Average	World	Pakistan
1935-39	1510	1125
1940-44	1635	1257
1945	1475	1121
1948	1578	1242

The moist climate of East Bengal is an ideal one for the growing of jute. The quality and quantity of fibres, however, depend on soils. Jute plant in East Bengal is grown in three different kinds of soil :—(*a*) the rich sandy loams of the highlands which produce the finest qualities of jute ; (*b*) the *Char lands, i.e.,* alluvial soils which are situated in the neighbourhood of the river tracts, and which are flooded during the rainy season ; such lands do not require manure ; (*c*) the marshes or low-lying tracts on the deltas of the rivers.

The commercial division of the jute tracts in East Bengal is as follows:—

1. Naraingunj.
2. Serajgunj.
3. Uttarya or Northern.
4. Dewrah.

'Naraingunj' jute is grown on the old Brahmaputra river valley in the districts of Mymensingh, Dacca and Tipperah. There is no other jute tract in East Bengal where water is so clear as that of the old Brahmaputra. Most of the tracts lie under flood water when the jute crop is still on the fields and, consequently, the fibre becomes 'rooty' and 'mossy'. Naraingunj jute is thus considered best in the market.

'Serajgunj' jute comes from the basin of the new Brahmaputra or Jamuna river in the districts of Pabna, Bogra, Rangpur and Western Mymensingh. The water of the Jamuna is nearly as clear as the old Brahmaputra.

'Uttarya'' or Northern Jute is obtained from the highland tracts in the districts of Rajshahi, Bogra, Rangpur, Dinajpur and Malda. The areas are supplied with water from the tributary rivers of the Brahmaputra. As only a limited part of the tract receives a direct supply of water from the river, the jute is to be steeped and washed in ditch-water. The colour of the jute is inferior because the ditch-water which is used for successive steeping becomes coloured.

'Dewrah' jute is grown in tracts watered by the branches of the river Ganges in Faridpur district. This jute is very strong but harsh and is suitable for making cordage and sackings.

Mymensingh alone raises more than 70 per cent. raw jute of Eastern Pakistan. The time for sowing is mid-February to mid-April and harvesting commences in mid-June and continues till early September. *The average yield of jute per acre is 1203 lbs.* In 1947-48, the yield per acre was 1329 lbs.—highest so far recorded in the world. About 2 million acres of land are under jute cultivation in East Bengal. The annual yield of raw jute is about 69 million bales (of 400 lbs. each). Jute cultivation is a very profitable occupation to the peasants in Eastern Pakistan who depend very much on it for their prosperity. There is not a single Jute mill in Pakistan. The present arrangements for the baling of raw jute are also unsatisfactory.

Consequently, the greater part of the jute crop is sent to be processed to the Indian Union from where again the produce is exported outside.

The total export of raw jute from East Bengal in 1947-48 amounted to 23 million maunds or 4·6 million bales. Of this 4·1 million bales were exported to Calcutta by steamers and country boats. The share of Chittagong in the total jute export was only 51,400 bales. The Government is taking steps to develop Chittagong so that the port may handle a large volume of export trade. There are at present neither marketing nor warehousing facilities available in Chittagong.

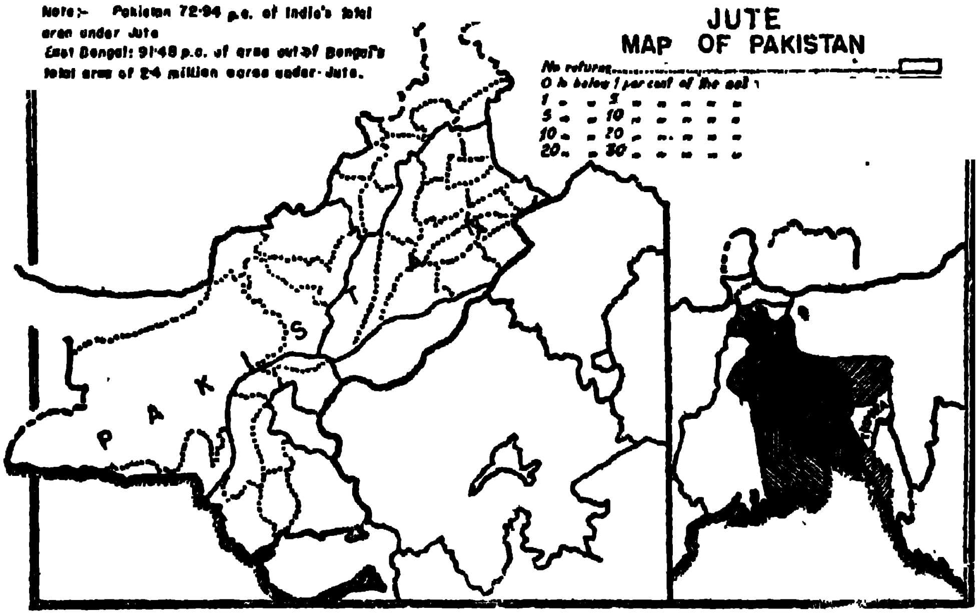
Note:- Pakistan 72·94 p.c. of India's total area under Jute
East Bengal: 91·48 p.c. of area out of Bengal's total area of 2·4 million acres under Jute.
JUTE
MAP OF PAKISTAN
No returns
0 to below 1 per cent of the soil
1 - - 5
5 - - 10
10 - - 20
20 - - 30
P
A
K
S

FIG. No. 167. Jute—a product of East Bengal. Mymensingh and Dacca are the chief jute-producing districts.

Many countries in view of recurrent jute shortages and the practical monopoly of this product held by East Pakistan have made experiments with substitutes. Belgian Congo cultivates *Urena Lobata* (a wild fibre plant indigenous to all tropical Africa) and has achieved an annual production of several thousand tons. A factory for making sacks from this fibre has just been established at *Leopoldville*. A similar but less good quality fibre is that known locally as *punga*. Production of these two fibres in Congo is to be stepped up during the ten-year plan from the present level of 11,000 tons to 24,000 tons per annum. Java has become almost self-sufficient so far as sugar bags are concerned by cultivating extensively a jute-like fibre called *Rosella.* A similar fibre called *Kenaf* is grown in Manchuria and is used for making bags for soyabeans. *Manila hemp* in the Philippines and *Polompon* in Indo-China are similar to jute. The production of such jute-like fibres may affect the jute cultivation of East Pakistan.

Oil-Seeds : About 1·8 million acres of land are under oil-seeds cultivation in Pakistan as compared with 20 million acres in India. The important oil-seeds are rape-seed and linseed. East Bengal is better placed in respect of oil-seeds, though the quality is inferior.

AREA AND PRODUCTION OF OIL-SEEDS (1945-46)

(Sesamum, groundnuts, rape and mustard, linseed and castor seed)

	Thousand acres	Thousand tons
East Bengal	634	112
West Punjab	446	77
Sind	263	45
N. W. F. P.	91	6
States	47	10
Total	1481	250

Linseed is mainly grown in East Bengal where 68,000 acres of land are under this crop, out of Pakistan's total of 78,000 acres.

Forests

Forests cover about 6 million acres of land in Pakistan, which, in terms of percentage, is only 1/30 of the total area.

Sind and North West Frontier Province are hardly forested, as these are mostly arid areas. The position of the West Punjab is no better, about 2 per cent. of area being covered by forests. The Eastern Pakistan has, however, considerable areas under forests along the southern coast as well as in Chittagong. Thus Pakistan forest resources are much less than its requirements and a suitable forest policy is required to meet the situation.

AREA UNDER FORESTS IN PROVINCES (1945-46)

(In thousand acres)

East Bengal	3117	N.W.F.P.	353
Sind	716		
West Punjab	1149		
Baluchistan	900	Total ..	6235

The principal trees which yield timber are the following:

(*i*) Babul in Sind, Baluchissan and the West Punjab;

(*ii*) Blue pine in North West Frontier Province and the West Punjab.

(*iii*) Gurjan in East Bengal, used for boat-building and packing cases.

(*iv*) Gamari in East Bengal used for boats, buoys and packing cases.

(*v*) Sundri in East Bengal.

(*vi*) Bamboo is an important plant throughout the eastern part of East Bengal and serves a number of uses. It grows abundantly in Noakhali, Tipperah, Mymensingh, Sylhet and Chittagong. As the price of bamboo is very cheap, its use in villages has become common for framework, walls and roofs of houses.

No statistics have been so far gathered as regards Pakistan's forest growth, exhaustion and requirements and potential productivity of forest lands.

Mineral Products

The present position of Pakistan in respect of mineral wealth is not very satisfactory, although she is endowed with diversified mineral wealth. Her great unexplored areas, however, afford promising fields. Till proper surveys are undertaken and new fields discovered, Pakistan will have to depend on foreign sources for basic minerals of industrial value. The Dominion does not now produce iron ore, manganese, monazite, copper, mica and bauxite. Several areas are now under examination, and it may be possible to get *iron deposits* in the North West Frontier Province, *manganese* in Chitral, Kohat and Baluchistan, *copper* in Baluchistan. Chitral and Waziristan, *mica* in Hazara district, West Punjab and Baluchistan and *bauxite* in Baluchistan. Substantial *deposits of coal of good quality* are reported to be lying below 250 feet in Baluchistan and West Punjab. Experiments in laboratories show that this coal, though not fit for use in boilers and allied purposes, is rich in many other valuable properties. The production of sulphur, coal, coal gas and distillation products extracted from this coal hold out promise for immense industrial development. In addition to this, coal brickets and coke brickets can also be produced from West Punjab coal which can be respectively used in boilers and for domestic purposes.

The mineral situation in Pakistan will demand serious consideration of the authorities. The country is in a somewhat anomalous position in that most minerals of industrial importance are located in Baluchistan, Chitral and western fringe of the N. W. F. P., but no minerals are mined in areas where the greater number of manufacturing industries are located and denser populations exist. The industrial and commercial exploitation of most of the minerals of Pakistan will depend on the development of cheap and rapid transport.

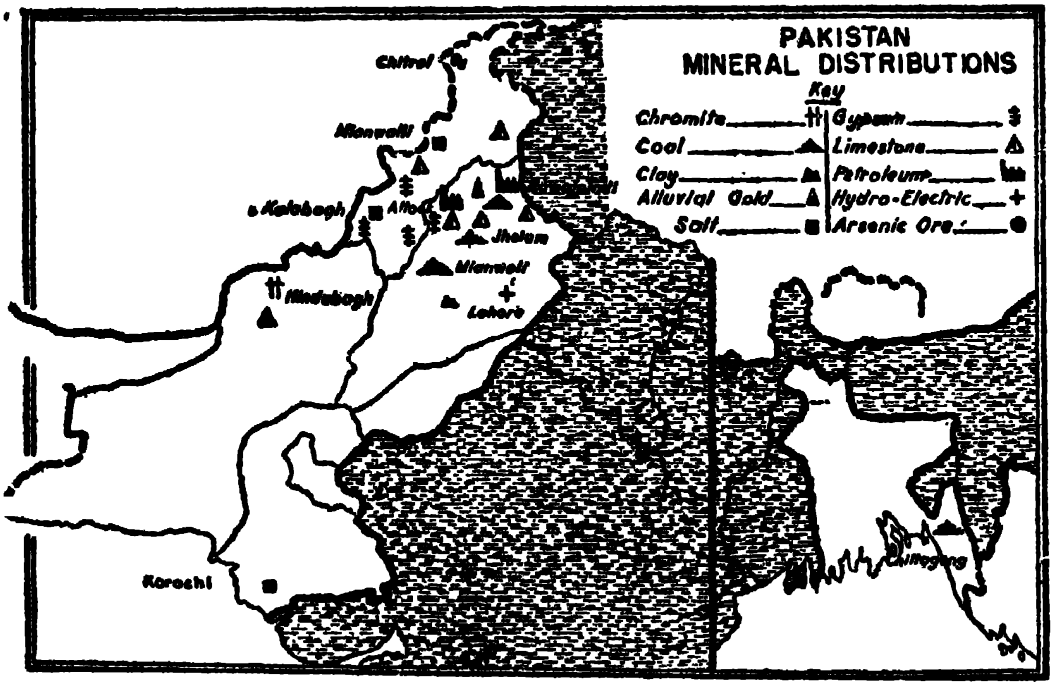

FIG. No. 168. Note the absence of minerals in Eastern Pakistan. Coal and Petroleum deposits may, however, occur in future.

The important minerals of the Dominion are Chromite, Petroleum, Salt, Saltpetre, Gypsum, Limestone, Clay, Fuller's Earth and Antimony.

Minerals	Annual Production	Areas of Production
Chromite ..	19,000 tons. Most of the Chromite is exported.	Upper Pishin valley and Hindubagh in Baluchistan; N.W.F.P.; Chitral.
Gypsum ..	In 1948, the production was 11,261 tons.	Jhelum, Shahpur and Mianwali in the West Punjab; Baluchistan; Sind; N.W.F.P. Large deposits of Gypsum have also been found in Dera Ismail Khan.
Fuller's Earth ..	In 1949, the production was 4,814 tons. This clay is non-plastic in nature and is used as filler in soap and paper and in paints.	West Punjab; N.W.F.P.; Sind.
Salt* ..	0·1 million tons. West Punjab salt mines produce about 60 lakh maunds of salt, while the Kohat mines yield between 7 to 8 lakh maunds. The production of sea salt in Sind is about 41 lakh maunds.	Sind, the West Punjab and N.W.F.P. The important field for rock salt is in Kohat. Common salt is manufactured at Mauripur (Sind).
Limestone ..	In 1948, the production of limestone was 355,441 tons.	Attock, Jhelum and Rawalpindi in the West Punjab; N.W.F.P.
Clay ..	Large quantity. Production in 1948 was 27,421 tons.	West Punjab. Fire clay in Dera Ismail Khan dist. Ochre and other coloured clays in Sind. & Chitral.
Saltpetre ..	Considerable quantity.	West Punjab.
Antimony ..	Large reserve—but not developed yet.	Chitral State and Kalat State. The inaccessibility of the neighbourhood, its elevation of 13,500 ft. and its climate, which is rigorous enough to limit work to 2 or 3 months in the year, have hindered any active exploitation up to the present time at Chitral State.
Alluvial Gold ..	Small quantity.	Jhelum district in the W. Punjab. At present gold is obtained by gold-washers from surface gravels only. Attempts are being made to work deeper gravels for gold.
Arsenic ore ..	Reserve unknown.	Chitral in N.W.F.P.
Granite ..	2,00,000 tons (total undivided India 16 lakhs).	The West Punjab and N.W.F.P.

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*Rock salt deposits are worked in the well-known Salt Range, covering parts of the districts of Jhelum, Shahpur and Mianwali. Near

Power Resources of Pakistan

One of the foremost needs of a modern nation is sources of mechanical energy, either coal, oil or water-power. The total installed capacity of the power houses in Pakistan is today 69,074 Kw., of which steam accounts for 32,868 Kw. and hydel 10,700 Kw., Diesel and gas give 25,450 Kw., and 56 Kw. respectively.

Both in quality and quantity Pakistan is today extremely poor in *coal.* The average annual production of coal is about 300,000 tons of tertiary type, not suited to cooking by present methods. In 1949, the production of coal was 331,964 tons. The principal coalfields are in Shahpur, Jhelum and Mianwali districts of West Punjab. The West Punjab coal, however, is "high in volatile matter, often very low in ash and remarkably rich in organic and pyritic sulphur." It is estimated that Baluchistan, N. W. F. P. and West Punjab contain 300,000 million tons of coal reserves.

In the N. W. F. P., there are three possible coal areas: (*a*) The Dore river of the Hazara district, (*b*) Kohat district just north of the Baroch gorge, and (*c*) Mira Kwand in the Spli Toi in South Waziristan.* In Baluchistan, the Khost area may become in future an important coal field. Already the Government has taken up the task of developing the Sharigh mines in Baluchistan.

In East Pakistan, on the other hand, coal, from all present indications, is most entirely lacking. Because of this, Eastern Pakistan has had to depend on imports for her needs. This coal comes from West Bengal. The latest information is that the eastern part of Chittagong contains coal deposits. But it is doubtful whether the area can become potential immediately.

There is a proposal to establish a Fuel Research Station in order to make the best use of Pakistan coal.

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the village of Khewra, the main seam has an aggregate thickness of 550 ft., of which five seams with a total thickness of 275 feet consist of salt pure enough to be placed on the table. The associated beds are impregnated with earth, and in places there occur thin layers of potash and magnesium salts. Open quarries for salt are developed a short distance to the east-north-east of Kalabag on the Indus, and similar open work is practised near Kohat in the N.W.F.P. where quantity of salt may be regarded as practically inexhaustible.

*Records of the Geological Survey of India: *Mineral Resources of the North West Frontier Province* by A. L. C. Coulson (1940).

Pakistan's total annual coal requirements under the present circumstances are for about 1·5 million tons. The country imports coal in increasing quantities from South Africa, China, Britain, France and Poland. South Africa alone can meet Pakistan's coal requirements for industrial and domestic purposes although this coal is slightly inferior to Indian coal and unsuitable for locomotives. As South Africa has her own mercantile marine, this coal can be cheaper than Indian coal so far as Pakistan is concerned.

Among all the mineral resources of Pakistan, *petroleum* is the most important. The total production of crude petroleum in 1949 was 823,550 barrels. Although geological formations give evidence of oil in several regions of Western Pakistan, only one is as yet a significant producer. This region is composed of two fields—Khaur and Dhulian at Attock in West Punjab. In 1929, the *Khaur field* had its maximum production of oil—480,222 barrels. Since then its output has declined rapidly. All the same, the field will remain an important producer for many more years. The *Dhulian field* reached its maximum in 1941 and its output too declined after that.

These two fields were developed by the Attock Oil Company in 1915 and 1937 respectively. The fields are located about 20 miles south of the outer foot of the hills of the Himalayas. Production in these two areas has been around 20 to 36 million gallons a year in recent years. The refinery is at Rawalpindi at a distance of 56 and 67 miles from Khaur and Dhulian respectively. Oil from these fields is brought in a pipe line to the refinery at Rawalpindi. Joya Mair, a new oilfield, about 40 miles south of Rawalpindi has also started production. This field holds out promise of greatly increased oil output in the West Punjab.

The West Punjab petroleum industry engages about 3,500 workers. Development work is being carried out by the Burma Oil Company at Lakhra, Sind, where the drilling has now exceeded a depth of 9,000 feet.

There are many possible areas of oil production in the N.W.F.P., Sind, Baluchistan and West Punjab. The Kohat Salt region, North Waziristan, Dera Ismail Khan and Bannu district may yield in future considerable oil. But, at the same time, it is to be noted that "in many parts of the Punjab, however, and in the Baluchistan area the roch-fields have been too deeply truncated by agents of denudation or have been dislocated by earth movements and much of the original stores of oil have disappeared; oil seepages are common enough, but most of them appear to be mere "shows not connected with reservoirs that can be tapped by artificial means". In Eastern Pakistan, oil indications are present in the districts of Sylhet and Chittagong. Prospecting work is likely to be started soon.

There is considerable scope for the development of hydro-electric power in Pakistan. Already four hydro-electric projects have been planned. These are (*a*) the Karnafuli Project in East Bengal, (*b*) the Rasul hydro-electric scheme in West Punjab, (*c*) the expansion of the Malakand Station in the N.W.F.P. and (*d*) the Dargai Station near Malakand.*

The Rasul Hydro-electric scheme is by far the most important project in West Punjab. The construction has already started. The project will utilize the head available from the Upper Jhelum canal into the Lower Jhelum canal. The project will develop 14,000 kw. of firm electric power and about 20,000 kw. of secondary power for several towns in West Punjab as well as for lift irrigation.

The Karnafuli Project of East Bengal contemplates harnessing the waters of the river Karnafuli for the development of power. The industrialisation in Eastern Pakistan is handicapped by lack of power. The Project will develop 60,000 kw. of energy. Chittagong, Chandpur and Comilla will be served from this source of power. In addition, the project will provide navigation facilities up to the mouth of the Karnafuli, irrigation facilities to an area of 70,000 acres and control of floods.

The Warsak dam, when completed, will raise the water-level of the Kabul River by about 150 ft. This will provide water for irrigation of nearly 60,000 acres on the right bank of the river belonging to Mullagoria and Afridi tribesmen and 5,000 acres on the left bank belonging to Mohmand tribes.

The Warsak project will help 1,000 tribesmen settle on new land, brought under irrigation, and supply them with power for local industries. The Kabul River Canal will also enable afforestation to be carried out over large areas on the lower slopes of the Peshawar hills. These forests will ease the problem of fuel shortage in Peshawar, while employment in forests will absorb a further number of tribesmen.

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* *The Malakand Hydro-electric plant* will supply power to cement works at Wah and electricity to 88 towns and villages of West Punjab and N.W.F.P. The *Warsak Hydro-electric scheme* located 20 miles from Peshawar will produce 100,000 kw. and will irrigate 65,000 acres of land in the Peshawar district.

All these are subsidiary advantages of the Warsak project. The most important is the power scheme which will generate 100,000 kw. This will be supplied to most parts of the West Punjab and will give an impetus to industrialization of that province to the benefit of the whole of Pakistan.

Fruit-production

Both from the standpoint of variety and volume, Pakistan is, indeed, very rich in fruits. Almost all the provinces in the State grow fruits on a commercial scale. The annual production is about 3 million tons. Between 60 to 70 per cent. is consumed in the State and the rest is exported.

The total area under fruit cultivation in Pakistan is about 409,500 acres.

East Bengal	200,000
West Punjab	150,000
Sind	50,000
Baluchistan	8,000
N. W. F. P.	1,500

East Bengal is noted for mangoes, pine-apples and bananas. Mangoes are raised in abundance in Rajshahi, Bogra, Dinajpur and Rangpur. Bananas come from Dacca, Faridpur, Noakhali and Bakarganj. Sylhet produces pine-apples.

The West Punjab has much developed the fruit industry in Rawalpindi, Jhelum and Attock districts. The Muree Hills may be consideded as the fruit garden of the province. Oranges, mangoes, lemons and sweet limes are the principal fruits. There is a plan to grow, on commercial lines, apples, walnuts, almonds and olives in the Muree Hills.

North-West Frontier Province grows pears, peaches, figs, plums, bananas and mangoes. Figs, peaches and pears have great demand both in the country and in the Indian Union.

Baluchistan depends for its economy on fruit trade. Grapes, apples, apricots and musk melons are grown extensively for markets in Pakistan and Indian Union. As a matter of fact, Indian Union is the best market for fruits coming from Baluchistan and N. W. F. P.

Sind has a large production of grapes and dates. Dates are also grown in Bahawalpur.

In spite of large production of fruits in Pakistan, the *fruit canning industry* is yet to be developed on modern lines. Pakistan promises to be a very important source of fruits in near future for the world markets.

Live-stock Population

The relief and climate of Pakistan are generally suitable for livestock population.

	In millions		*In millions*
Cattle ..	.. 20·3	Goats ..	.. 8·0
Buffaloes ..	.. 5·4	Horses & Mules	.. 2·0
Sheep ..	.. 5·5	Camels ..	.. ·4

The climate of Baluchistan and Sind does not produce good pasture, so that in those provinces cattle are not so important as in the West Punjab. Although the number of cattle is large in Eastern Pakistan, the quality is inferior to that of the Western Punjab in regard to milk and meat production. The grass has deficiency in phosphorus and this makes cattle liable to disease.

In Eastern Pakistan, heavy rainfall does not encourage rearing of sheep and buffaloes. Nor can camels stand the climate. Cattle and goats, however, are mostly found in this area. In Western Pakistan, camels are mostly found in Sind and Baluchistan. North West Frontier Province, Baluchistan and Sind support a large number of sheep. Buffaloes are mostly found in the West Punjab.

The principal products are milk, hides, skin and wool. *Dairy industry* has developed in the southern side of West Punjab—particularly in the districts of Montgomery, Lyallpur and Multan. *Leather industry* is of growing importance. The annual average production is as follows: cow hides (4·5 million pieces), buffalo hides (·8 million pieces), goatskin (5·3 million pieces) and sheep skin (2·0 million pieces). Although raw materials are plentiful, tanning industry has not yet developed in Pakistan. *The annual production of raw wool in Pakistan is about 22 million lbs.* The best wool comes from Sind and Baluchistan. In 1948, Pakistan exported about 130,000 bales of raw wool to Europe and America. The chief buyers of raw wool are the U. K. and the U. S. A. Pakistan is not likely to develop export trade in meat although her leather export is important.

Fisheries

The Pakistan fishing industry, while nationally not as important as agriculture and livestock industries from the standpoint of value of products and numbers of men employed, is, nevertheless, of vital importance to the economy of the Dacca and Faridpur districts in East Bengal as well as of the Sind coast.

Fresh fisheries in Eastern Bengal perform an important function by adding to the food supply. In East Bengal, any diminution of activity in the fishing industry results profoundly in worsening the food position. The annual output is far beyond the consuming capacity of the province and, therefore, can be exported to the Indian Union. Boats are extensively used for carrying fish to rail or steamer heads at Narayangunj, Chandpur and Goalundo. The important catches are rohu, hilsa, catla and prawns. Fish like kai, magur, singi and sal are abundant in ponds and *bils* of East Bengal. The East Bengal Government are taking a keen interest in the development of fisheries on modern scientific lines. Their rural pisciculture scheme has already recovered about 350 tanks and about 700 bighas of water in 1949-50. Besides this, the Government are undertaking a 10-year scheme for the reclamation of derelict tanks and water-logged areas for the purpose of using them for fish production.

In Western Pakistan, the industry is concentrated along the coast of Sind.

The entire sea-coast along Sind and Baluchistan is important for fishing industry. About 39,000 people of Pakistan are engaged in it. The production of sea-fish off Baluchistan coast is about 93,000 maunds a year.

TOTAL CATCHES PER YEAR IN SIND

(In 000 maunds)

Sea-fish	198
Fresh-fish	266·5
	464·5

The catches are prawn, salmon, mullet, pomfret, mackerel and hilsa. Sind is a great exporter of fish. The Sind Government is carrying out systematic work in preparing and analysing the oils obtained from the liver and body of fishes, such as skates, rays and other varieties which were hitherto not utilized. As a result of the utilization of these fishes, it will be possible to manufacture glue and gelatine. A little quantity of fresh fish is also caught in N. W. F. P.

Manufactures

"The most striking feature of Pakistan's present economy is the marked contrast between its vast natural resources and its extreme industrial backwardness." This backward position has been the result of certain forces: first, in the early years of the last century, the organised industries were located in Calcutta, Bombay and Ahmedabad ; secondly, during the World War I, the movement in the development of manufactures started in the central regions like Indore, Kanpur, Nagpur, Tatanagar and Jubbalpur ; and thirdly, technical institutions, research laboratories, credit and service agencies have developed mostly in Calcutta, Delhi, Madras, Bombay, Kanpur, etc. Thus, the regions now constituting Pakistan are not industrialised when judged by the number of establishments and persons employed therein.

LARGE INDUSTRIAL ESTABLISHMENTS IN 1946-47

	East Bengal	N.W.F.P.	West Punjab	Sind	Total
Cotton mills	9	—	4	1	14
Sugar Factories	6	1	4	—	11
Cement	1	—	1	2	4
Soap	1	—	1	2	4
Glass	2	—	3	—	5
Chemicals	—	—	2	1	3
Matches	4	—	2	—	6
Woollens	1	—	1	—	2
Silk	—	—	—	2	2
	24	1	18	8	51

About 200,000 persons are employed in the main industries of Pakistan.

The future of Pakistan, however, in matters of industrial development is hopeful. A number of minerals like coal, iron and oil may be discovered on a proper geological survey although it will take time. The present shortage of capital goods and capital for the expansion of various industries for which raw materials are available, will not remain a problem for ever. She can depend upon external sources for capital to finance equipment for the development. Unless accurate and exhaustive statistics about Pakistan are made available foreign capital will be slow to enter Pakistan.*

Cotton mills : At present Pakistan has 14 cotton mills with 4,877 looms and 184,616 spindles. The industry gives employment to about 19,000 persons. The annual production of mill cloth is about 190 million yards against 235 million yards produced by hand looms. East Bengal leads in the cotton textile industry with 9 cotton mills having 95,208 spindles and

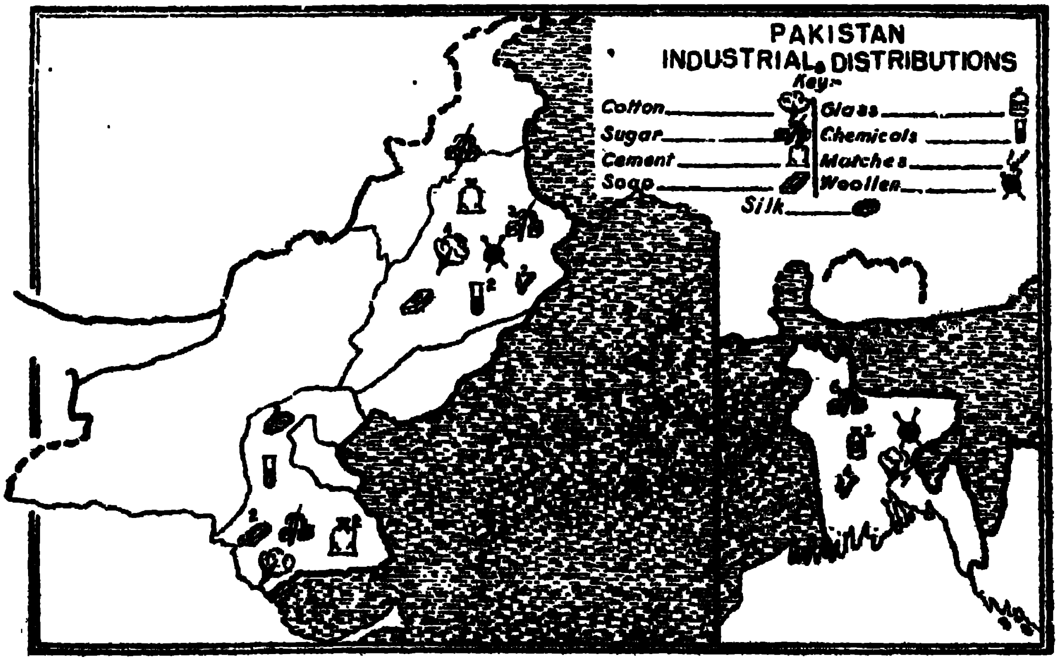

FIG. No. 169. The number against each industry refers to 1947-48.

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* She must, if she is to attract the foreign capital she needs, make clear to potential investors that they are welcome, that no further nationalisation is intended, and that the remission of profit will not be hampered. (See Lord Burghley's Report on U. K. Industrial Mission to Pakistan.)

2,522 looms. Four more mills are in the course of erection. The mill centres in East Bengal are Khulna, Bagerhat, Narayanganj and Kushtia. Six mills are in Narayangunj with 1787 looms and 41,852 spindles.

In West Punjab, the cotton mill centres are Lyallpur, Lahore and Okara. Karachi is the only centre for cotton mills in Sind.

The Dominion is not self-sufficient in cloth, the shortage being for about 500,000 tons (500 million yds.).

The future of cotton industry is full of promise, as Pakistan is a great producer of raw cotton and consumer of cloth. The Government may undertake the construction of textile factories, if private capital is not forthcoming.

Pakistan imports cotton textiles mostly from the United Kingdom, though low-grade Japanese textiles are also in great demand for their low prices.

Sugar Industry :

Eleven sugar factories in Pakistan are distributed as follows :—

Regions.	No.	Centres.
East Bengal	6	Dacca, Rajshahi, Mymensingh, Dinajpur, Jessore.
West Punjab	4	Rawalpindi.
N.W.F.P.	1	Abbotabad.
	11	

The annual production of sugar is between 25,000 and 30,000 tons, against the annual consumption of 200,000 tons. East Bengal can increase her production of sugar-cane in Mymensingh, Chittagong, Dinajpur and Rangpur where the soil and climate are favourable for this crop. A sugar factory, the biggest of its kind in Asia, is being constructed at *Mardan* in N.W.F.P. It will have a capacity to produce 50,000 tons of finished sugar per year. This would be a great step towards making Pakistan self-sufficient in sugar.

The Woollen Industry : Tweeds, rugs, carpets and blankets are being manufactured in Sind and Western Punjab. The woollen industry in Sind is mostly confined to the desert areas. A factory has been established recently at Karachi for the manufacture of yarn and worsted yarn. Pakistan's blanket industry consumes about half the raw wool production of the country.*

There are six *match factories* located at Lahore and Dacca. Of the three factories in Lahore, two are owned by the Western India Match Company. The Lahore factories employ about 500 workers recruited locally from Lahore and its surrounding villages. The *cement industry* is well organized. The centres are Wah (in the Attock district), Karachi and Sylhet. The factory at Wah belongs to the Associated Cement Companies and employs about 1,500 workers recruited mostly from the adjoining villages. The Associated Companies also own the cement factory at Rohri in the Sukkur district of Sind. The annual production of cement is about 600,000 tons, of which 50 per cent. is required for domestic consumption. The *glass industry* is of recent growth. There are five factories—two in East Bengal and three in the West Punjab. Dacca is the chief centre of glass manufacture in East Bengal.

Pakistan Government is taking steps to develop various manufacturing industries. Three *jute mills* of 100 looms each are likely to be started soon in East Bengal. These jute mills are likely to be located in Chittagong. Although Pakistan has no *paper mills* at present, the supplies of chemicals and other raw materials are considerable for the development of paper industry. Resin, salt and lime of West Punjab and the large quantities of bamboo in East Bengal can help the location of paper industry. There is a proposal to start a paper mill at Kaptaimuk, halfway between Chittagong and Rangamati, as the surrounding region is very rich in bamboo resources. Strawboard and cheap wrapping paper can be manufactured in Karachi.

Communication

Pakistan has means of expanding transportation by land, air and water. Since the country is an agricultural one and has large surplus of products for export, the transport systems will always play a vital part in Pakistan's economy.

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* The Pakistan Government have sanctioned the establishment of two woollen mills with 2,000-spindle capacity each. The mills will be located at Hannai in Baluchistan and Bannu in N.W.F.P. and are expected to be in operation in 1952.

Railways : In Pakistan there are 6,748 miles of railway lines. Before the partition the Pakistan-railway-system was part of the B. A. Rly. and the N. W. Rly. The railway system of Pakistan was originally designed primarily for strategic purposes and also for the transport of agricultural produce from the irrigated areas of N.W.F.P., Punjab and Sind to Bombay, Delhi and Karachi. The railways in East Bengal also had as the objective the supply of raw materials, *e.g.*, jute to Calcutta. The railway system is now to be rearranged within the confines of the country's geographical boundaries to meet the changed

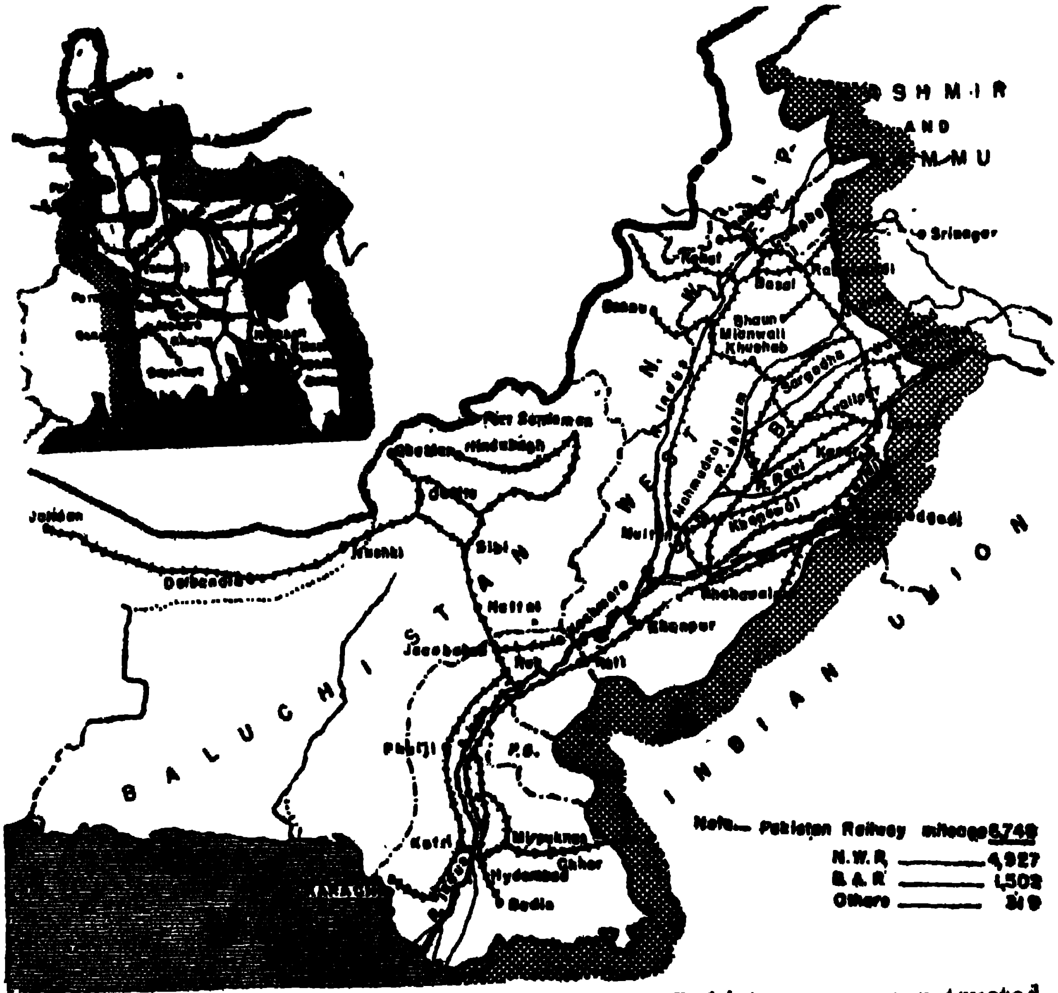

FIG. No. 170. The railway lines in Western Pakistan were constructed not so much to serve the natural industrial and commercial needs of the country as for strategic requirements.

conditions. Not only there is lack of coal in the country, but rolling stock is also in short supply.*

The N. W. Rly. has its headquarters at Lahore. It has about 5,400 miles of line with 4,500 miles of broad gauge. There are two main lines with several branches.

(*a*) Lahore to Peshawar *via* Wazirabad, Rawalpindi and Attock. From Wazirabad a line goes to Sialkot on the border of Kashmir.

(*b*) Lahore to Karachi *via* Khanewal, Lodhran, Rohri and Sukkur. The line crosses the Indus at Rohri. From Sukkur a branch line goes to Zahidan *via* Sibi and to Chaman *via* Quetta.

There are also other branch lines which connect Wazirabad with Khanewal; Peshawar with Muzaffargarh; Rohri with Badin.

In East Pakistan with 1,600 miles of line, there are two distinct systems of railways—broad gauge and metre gauge. The Brahmaputra divides the country into two parts. On the right bank of the river the railways consist of broad gauge track, which is mostly single-line and a relatively small mileage of single-line metre gauge. On the left bank of the river the country is served by a metre gauge single-line track with Chittagong as the terminus. There is no direct connection between the two systems except by river transport. The main railway lines of the E. B. Ry. run from Chittagong in metre gauge: (*a*) Sylhet *via* Laksam, Comilla, Narayanpur and Kulaura. From Laksam, there is a branch line to Chandpur; (*b*) to Bahadurabad *via* Narayangunj and Mymensingh. Mymensingh is connected by a line with Dacca. There is now much congestion of traffic in the line between Chittagong and Bhairab Bazar, now that most of the trade of East Pakistan passes through Chittagong. There is a proposal to double the line along this system to cope with the increased and increasing traffic. Poradah is an important railway junction of the broad gauge lines. From here lines go to (*a*) Serajgunj on the Jumna in Pabna ; (*b*) Rajbari on the Padma and thence to Faridpur ; (*c*) Domar *via* Iswardi and thence to Darjeeling. "With the development of Chittagong and consequent change in the pattern of traffic, the maintenance of broad gauge in this area is expected to become uneconomic. In order to introduce rationalisation, reduce the cost of maintenance and avoid the break of gauge at various points in the country, the Railway Department has been examining the possibility of converting this line to metre gauge."* The railway mileage in Eastern Pakistan is 1,502.

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* The main difficulties of the Pakistan railways are :—

(*a*) Shortage of trained technical staff;
(*b*) Lack of suitable workshops and repair facilities in East Pakistan;
(*c*) Uncertainty in respect of coal;
(*d*) Shortage of locomotives, wagons and carriages.

The Government is making *Saidpur* workshop fully equipped. Another workshop is being set up at *Pahartali*.

The position in respect of coal is causing anxieties. "A programme of conversion of locomotives to oil burning is in hand. 172 locomotives have already been converted and the intention to convert at least 50 per cent. of the existing fleet of locomotives on N. W. Ry. as soon as availability of raw material permits" (vide Government of Pakistan—Transport and Industry by the Ministry of Industries).

Road transport in the modern sense of the term is highly developed in the West Punjab and N.W.F.P., where there are about 8,000 miles of metalled road consisting of main and trunks. In East Bengal, however, heavy rainfall and existence of numerous rivers make road construction difficult and expensive. There are no trunk roads in East Bengal. The total mileage of roads in Pakistan is about 58,000.

	Superior Surface Roads	Metalled Roads	Unmetalled Roads	Total
Punjab	2,694	410	12,883	15,987
N.W.F.P.	1,103	120	1,899	3,122
Sind	597	160	11,648	12,405
Baluchistan	586	637	3,453	4,676
E. Pakistan	594	1,028	20,172	21,794
Total	5,574	2,355	50,055	57,984

(Sourse : Current Affairs, 1952, Calcutta).

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* Transport and Industry by Government of Pakistan published by Ministry of Industries.

The main difficulties of E. B. Ry. are the uncertainty of the supply of coal, shortage of locomotives and wagons and lack of suitable workshop and repair facilities. The E. B. Ry. depends on the supply of coal from India, a factor which is a matter of concern to Pakistan in view of the not too friendly relations with India. Nor is it economical to import coal from distant places like South Africa and Australia. Then, again, locomotives and wagons are too difficult to obtain in number as required by Pakistan from U.K. and U.S.A. because of the demand from several countries for such materials. For workshop and repair facilities, Pakistan Government has undertaken to develop two centres —at Saidpur and Pahartali.

Frontier roads :

There are five main land-routes which connect Pakistan with Iran, Afghanistan and Sinkiang.

(*a*) From Chaman (in Baluchistan) along the Khojak Pass to Kandahar and Herat.

(*b*) From Quetta to Zahidan on the Iran-Baluchistan border by a branch line of the N. W. Railway ; thence by caravan route to Iran. Of late, regular motorable roads have been opened connecting Zahidan with Teheran *via* Bam, Kerman, Yezd, Ardistan and Kasan.

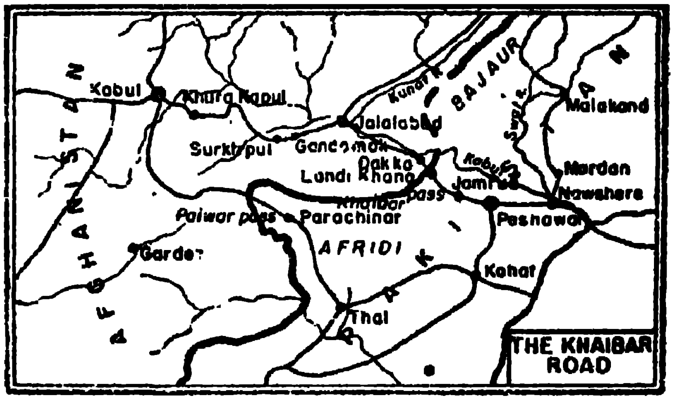

FIG. No. 171.

(*c*) From Pashawar along the Khyber Pass (3,370 ft.) to Kabul and Jalalabad. The distance between Peshawar and Kabul is about 170 miles. The Khyber Pass is only 30 miles long.* This is the only easy outlet to Afghanistan from the Western Pakistan. This is the route by which Alexander the Great, Timurlane, Chenghis

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* **Alternative to Khyber Pass Trade Route.**

The possibility of the development of an alternative trade route to the existing highly expensive motor lorry road over the Khyber Pass is envisaged in the construction of Pakistan's Warsak hydro-electric station.

The dam will result in penning up the water of the Kabul River and make this stretch of the river navigable. This part of the river could also be used as a water reservoir for fisheries and industries being developed in the N. W. F. P.

The Warsak dam, when completed, will raise the water-level of the Kabul River by about 150 ft. This will provide water for irrigation of nearly 60,000 acres on the right bank of the river belonging to Mullagoria and Afridi tribesmen and 5,000 acres on the left bank belonging to Mohmand tribes.

The Warsak project will help 1,000 tribesmen settle on new land, brought under irrigation, and supply them with power for local industries. The Kabul River canal will also enable afforestation to be carried out over large areas on the lower slopes of the Peshawar hills. These forests will ease the problem of fuel shortage in Peshawar, while employment in forests will absorb a further number of tribesmen.

All these are subsidiary advantages of the Warsak project. The most important is the power scheme which will generate 100,000 kw. This will be supplied to most parts of the West Punjab and will give an impetus to industrialization of that province to the benefit of the whole of Pakistan.

Khan, Nadir Shah and others invaded India. The route has followed Kabul river. From Peshawar to Landikhana—a distance of 55 miles—the road lies far to the south of the river.

(*d*) From Attock, in the West Punjab, to Kashgar (Sinkiang) *via* Chitral and Hindukush.

(*e*) From Dera Ismail Khan along the Gomal Pass (7,500 ft.) to Kalat and Kandahar. The Gomal Pass as a trade route is the oldest of all trade routes in the Indo-Pakistan sub-continent. From the plains of Afghanistan, every year thousands of traders with the caravans enter the sub-continent down the Gomal. The traders bring camel loads of silk and fruit, bales of camel and goat hair, sheepskins and carpets from Kabul and Bokhara.

Waterways : The rivers of Western Pakistan are little used for transport. Though the Indus is one of the greatest waterways of the world, it has ceased to carry traffic since the railway traversed its valley.

The Indus rises on the north side of the Kailash range, near the source of the Sutlej. The Indus flows first north-west through Ladak between the Kailash and the main Himalayan range up to Gilgit, from where it takes a sharp bend towards the south and maintains this direction for the rest of its course. Near its mouth the Indus divides into distributaries "which form intricate channels across its reed-covered delta, fringed with mangrove swamps". In its upper and middle course, the Indus receives the waters of the *Shayok, Kabul, Kuram* and *Gomal.* But the most important tributaries are the *Jhelum, Ravi, Chenub* and *Sutlej*—all flowing from the western Himalayas and joining the Indus at Mithunkot. These four great tributaries, with the Indus itself, give their name to the Punjab —that is, the "Five Waters".

The Indus is 1,800 miles long and is navigable for 1,000 miles from its mouth. The shifting character of its banks and sudden floods during the rainy season are responsible for the absence of important towns on its course. It is interesting to note that Multan, Lahore, Lyallpur, Wazirabad and Bahawalpur are situated not on the main stream but on its tributaries.

In Eastern Pakistan, the river navigation occupies a very important place. There is no other region in the world which has so many navigable rivers, distributaries, channels and creeks as in East Bengal.

The chief rivers of East Bengal are the Padma, the Brahmaputra and the Meghna. *The Padma* is really the continuation of the Ganges.* It flows towards the south-east from the Murshidabad-Maldah districts through Rajshahi, Pabna, Faridpur and Dacca. *The Brahmaputra* from Assam enters East Bengal in Rangpur and flows towards the south and joins the Padma near Faridpur. *The Meghna,* known as the Surma in Sylhet, meets the Padma near Chandpur.

Regular steamer services are maintained between (*a*) Chandpur and Narayangunj ; (*b*) Goalundo and Chandpur ; (*c*) Goalundo and Narayangunj ; (*d*) Dacca and Barisal ; (*e*) Barisal and Lohajang. These services are essential not only for passengers but also for the movement of jute and rice of Pakistan.

Aviation : It maintains swift communication between the two parts of the country awkwardly divided by the great land mass of the Indian Union.

Pakistan is to-day supplied with airports and aerodromes in many parts of the country and is in a position to meet the expansion of aviation that has resulted from post-war developments. The important aerodromes are at Karachi, Lahore, Quetta, Peshawar, Hyderabad (Sind), Multan, Dacca, Chittagong and Sylhet. Two companies—Orient Airways and Pak Air Services—maintain services in Pakistan. They also operate services to Bombay, Calcutta and Delhi in the Indian Union as well as to Ceylon, Burma, Singapore, Teheran and Cairo.

THE PRINCIPAL AIR ROUTES (1948-49)

1. *Orient Airways*

Karachi—Quetta—Lahore	2 weekly
Karachi—Lahore—Rawalpindi—Peshawar	3 ,,
Karachi—Calcutta—Dacca—Chittagong	3 ,,
Karachi—Ahmedabad—Bombay	3 ,,
Karachi—Quetta—Zahidan—Meshed—Teheran ...	1 ,,
Calcutta—Dacca	daily
Dacca—Chittagong—Sylhet	,,
Calcutta—Chittagong	,,
Chittagong—Akyab—Rangoon	,,

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* The Ganges divides itself into two parts near Maldah, one part flowing towards the south as the Bhagirathi and the other towards the south-east as the Padma.

2. *Pak Air Services*

Karachi—Lahore	daily
Karachi—Delhi	,,
Lahore—Delhi	,,
Lahore—Rawalpindi—Peshawar	3 weekly
Karachi—Bombay—Colombo	3 ,,
Karachi—Calcutta—Rangoon—Singapore ...	3 ,,
Karachi—Cairo	2 ,,

Karachi is the principal airport. Its position on the international trunk routes has made it very important.

KARACHI AIR PORT TRAFFIC

(Monthly average based on January to May 1948)

Aircrafts arrival and departure	979
Passengers embarking and disembarking ...	8,228
Passengers in transit	3,524
Mails on-loaded and off-loaded	107,722 lbs.
Mails in transit	221,797 lbs.
Freight on-loaded and off-loaded	339,423 lbs.
Freight in transit	158,314 lbs.

The Pakistan air-line service with the Indian Union is being operated under agreement with the India Government.

Pakistan's air-lines, however, are not yet profitable commercially. Load factors and utilization of planes are below economic levels. In Eastern Pakistan, lack of technical personnel and radio equipment have prevented services to Faridpur, Comilla and other places having war-time aerodromes.

Ports and Trade Centres

Pakistan has access to the Arabian Sea and the Bay of Bengal. The two important ports are Karachi and Chittagong.

Karachi. Karachi is the most important port of Pakistan. It is provided with a splendid natural harbour. Its hinterland is very extensive covering as it does Persia, Afghanistan, Baluchistan and the West Punjab. The importance of the port increased after the opening of the Suez Canal. The principal exports are wheat, oil seeds, cotton, wool, hides and bones. The imports are cotton manufactures, sugar, metals, machinery, oil, woollen manufactures, liquor, chemicals, etc. Karachi is more noted for commerce than for industries. With the exception of wheat, other industries are little developed. Karachi is connected with its hinterland by the North Western Railway.

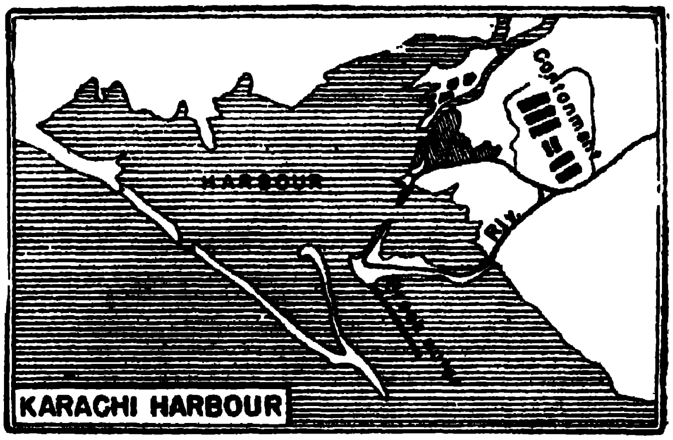


Fig. No. 172.

A striking increase in the volume of tonnage handled by the port of Karachi has been recorded during the past three years, ever since the birth of Pakistan. Though exports have declined during the period, imports have, nevertheless, risen and the gross turnover of tonnage has progressively increased as is borne out by the following table:

Year		Imports	Exports	Total
1947-48	...	11,56,353	10,27,521	21,83,874
1948-49	...	16,02,747	9,39,934	25,42,681
1949-50	...	19,08,422	9,23,476	28,31,896

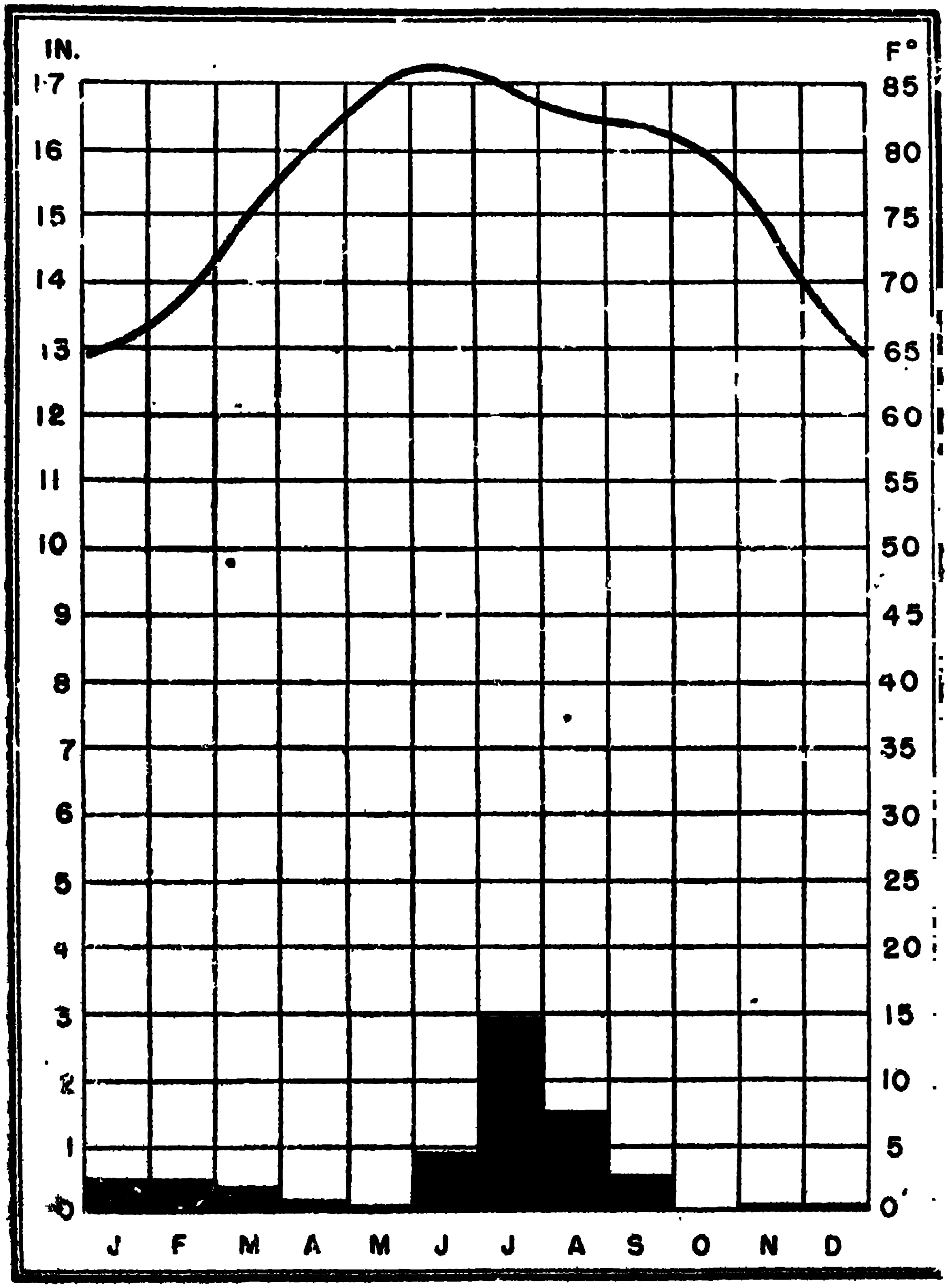
The figures for the past year almost equal the record of 28,63,567 tons attained during the war in 1944-45.

To increase the capacity of the port still further by 34 per cent. to 50 per cent., the Karachi Port Trust has a scheme under consideration to undertake an improved lay-out of the 17 berths of the East Wharves which are constructed of wooden decking and need rebuilding.

The Karachi Port Authorities have also helped industry by the lease of plots of land served by rail and road to various industrial concerns.

The Government is considering the construction of a fishermen's harbour with a boat-slip and yard, served by road and rail, and space for boats, drying of nets, refrigeration, canning and other developments.

Chittagong is an important outlet for the produce of East Bengal. It is situated at a distance of 11 miles from the mouth of the Karnafuli river. The chief article of export is tea. The other exports are jute, kerosene, rice and raw cotton. The



KARACHI

Fig. No. 173.

imports are chemicals, machinery, metal, salt, cotton goods and sundry instruments. The port facilities are limited and already strained to the utmost. There is now a serious ware-housing problem.

During the last three years there has been a steady increase in handling capacity of Chittagong. At the time of partition the port could handle only 600,000 tons of goods a year. Capacity has now been raised to 1,800,000 tons by an expenditure of Rs. 10 million on the most urgent needs.

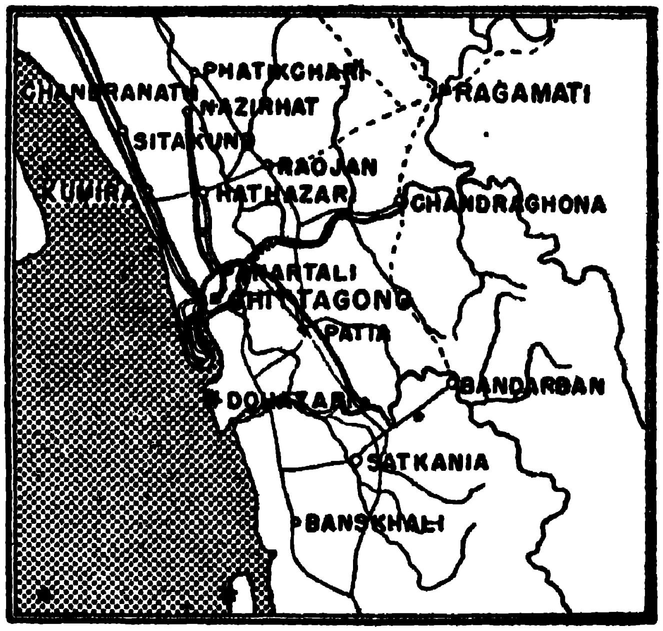


FIG. NO. 174.

Recently a Committee has been set up by the Government to consider schemes for the development of the port in respect of harbour equipment and accommodation which will further increase its capacity to 4,000,000 tons. The development of Chittagong port has been given very high priority in the Pakistan Government's six-year plan, which is one of the projects associated with the Colombo Plan.

Side by side with the development of Chittagong port, the Government of Pakistan has decided to open near *Chalna* (district Khulna) on the river Pusoar, an inland port to handle ocean-going vessels. This has been done for one year, in the first instance, as an experimental measure. The question of making this a permanent anchorage will be decided after the year's experience. The new port will relieve both the Chittagong port and the Eastern Bengal Railway of pressure of traffic. It will handle outgoing jute and tea and incoming coal and food-grains. The yearly tonnage that will be handled is estimated at 500,000. The Pakistan Government also made surveys for finding suitable sites for alternative ports on the banks of the

Harringhatta and the Meghna. The Harringhatta has a bar at its estuary which makes it unsafe for vessels. The Meghna, on the other hand, is constantly shifting its course.

The other minor ports are *Cox's Bazar* and *Noakhali* in Eastern Pakistan.

The West Punjab has an area of 61,775 square miles with about 13 million population. The density per square mile is 263 persons. Agriculture is the main occupation of the population. The province is rich in rock salt, petroleum and coal of tertiary origin.

There is a large number of towns with population more than 100,000 in each. The important towns of the West Punjab are Lahore, Rawalpindi, Sialkot, Lyallpur and Multan.

Lahore, the capital of West Punjab, is the largest city and the chief trading centre of the province. It stands on the river Ravi and is 33 miles distant from Amritsar. Cotton weaving, tanneries, glassworks, flour mills, sugar mills, etc. are the chief industries. Leather trade is important. According to 1941 census the population is about 700,000.

Lyallpur, 87 miles south-west of Lahore, is the biggest wheat-exporting centre of West Pakistan

Multan is a frontier town. It is an important collecting centre. It brings fruits, drugs, silk and spices from Afghanistan and passes them on to the East. It is connected by railways with Lahore and Karachi.

Sind has an area of 48,136 square miles with 4·5 million population. About 62 per cent. of the population are engaged in agriculture. Industry occupies about 8 per cent. of the population, while in fishing about 39,000 people are engaged. The principal exports are raw hides and skins and wheat. The trade centres are *Karachi, Sukkur, Hyderabad, Badin* and *Jacobabad.*

The North West Frontier Province is mountainous and covers an area of 39,270 square miles, of which the Tribal territory accounts for 24,986 square miles. It has a population of 3 million. The chief trade centres are Peshawar, Abbottabad, Dera Ismail Khan and Thal. *Abbottabad,* with a population of 40,000, is a hill station on the border of Kashmir. Leather and stone works are carried on in the city on an extensive scale. Recently certain weaving and spinning mills have been established. *Peshawar,* the capital of the Province, is an important military and trading centre.

Baluchistan is the largest unit in Pakistan, and covers 134,002 square miles. The population is only 857,835 which gives a density of 9 persons per square mile. The plains are barren and stony. The climate is subject to extreme heat and cold, and the rainfall scanty and uncertain. The region is noted for fruits like grapes, apricots, peaches, apples, pears and melons which are cultivated with the help of irrigation. The principal trade centres are *Quetta, Chaman, Zahidan* and *Hindubag.* The capital is Quetta.

In *East Bengal,* the important towns are Dacca, Narayanganj, Mymensingh, Faridpur, Rangpur, Sylhet and Chandpur. The major industries of East Bengal are tea with largest number of establishments, jute presses with largest number of workers employed, followed by cotton spinning and weaving mills. Rice mills, like tea factories, are numerous but engage less number of employees than those in railway and engineering workshops and sugar factories.

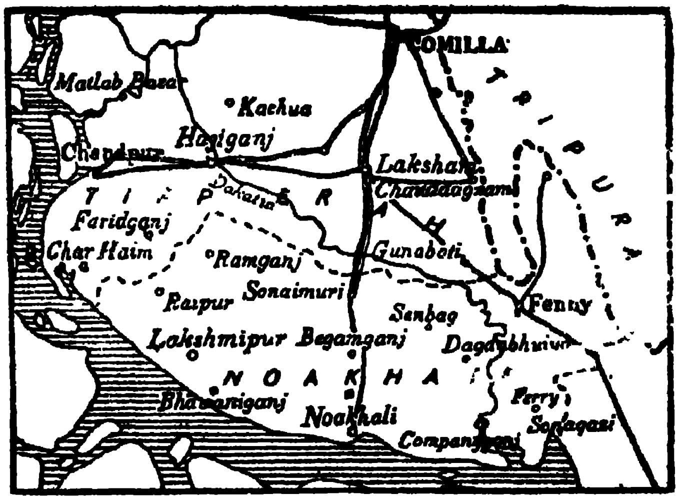


FIG. No. 175

In East Bengal, there are 116 tea industries, 84 rice mills, 65 jute presses, 21 general engineering establishments, 14 hosiery and knitting mills, 13 railway workshops, 13 cotton mills, 9 sugar factories, 6 boat-building and repair shops and 6 printing and book-binding establishments.

Dacca is famous for shell bangles and for the works on gold and silver. It is the most important inland trade centre. It is situated in the heart of the jute-growing districts. *Narayanganj* is practically the port of Dacca. It is an important centre of trade in Eastern Bengal. It has a population of about 45,000. *Sylhet,* on the Surma river, is important for fruits and lime.

Foreign Trade

Pakistan is not self-sufficient in many commodities required by modern industry. Coal, machinery, textiles, automobiles, chemicals, paper, iron and steel goods, sugar and rubber products are all used in large quantity by Pakistan industry or needed to fill the wants of the Pakistan consumers. The maintenance of a large volume of trade is, therefore, of great importance. It is only by importing on a large scale that she can meet her needs for the many goods that can be produced in Pakistan.

The principal items of exports are raw cotton, raw jute, raw wool, woollen manufactures, gypsum, potassium nitrate, raw hides and skins. Some foodgrains, tea, fruits and vegetables are also exported. Raw jute constitutes the most important item of export as the entire production is exported. The next item is raw wool. Hides and skins of Pakistan have demand outside and in 1950-51, these articles were third in the list of exports. Cotton is an important article of export. About two-thirds of the cotton production are exported outside including India. Indian Union, United Kingdom, Belgium, U.S.A., Russia, Italy, France, China and Australia are the chief destinations of Pakistan exports.

THE VALUE OF THE CHIEF ARTICLES EXPORTED
(1950-51)

Articles	Lakhs of rupees	Articles	Lakhs of rupees
Raw Jute	67,83	Tea	1,73
Raw Cotton	1,01	Cotton Seeds	76
Raw Wool	6,84		
Hides and Skins	4,92	Value of Total Export	194,07

Indian Union imports chiefly raw cotton, raw jute, raw wool and foodgrains from Pakistan.

The chief items of imports are textile yarn and manufactures, mineral oils, machinery, steel and manufactures thereof, motor cars, chemicals, food, paper, electrical goods, etc. Her imports from India include cotton cloth and yarn, jute manufactures, sugar, gur, iron and steel, paper and coal.

Cotton textiles account for 25 per cent. of Pakistan imports. The sources of imports are Indian Union, U. K., U.S.A., Italy, Iran, China, Ceylon and Straits Settlements.

VALUE OF THE CHIEF ARTICLES IMPORTED (1950-1951)

Articles	Lakhs of rupees	Articles	Lakhs of rupees
Cotton twist and yarn ..	30,21	Oils	3,44
Cotton piece goods ..	43	Rubber manufactures ..	17,10
Metals and ores ..	6,05	Woollen goods ..	1,30
Hardware	2,77		
Vehicles	6,31	Value of Total Imports	136,37

Britain furnishes over 30 per cent of Pakistan's *overseas* imports and takes nearly 25 per cent. of her exports. Cotton textiles are Pakistan's largest single import from .Britain. Recently the value of U. K. cotton exports to Pakistan has dropped considerably. This is because the quality is not right for the market. "While the textile famine lasted Pakistan buyers were willing to take British goods in large quantities because no alternative was offered. Now, with low-grade Japanese textile readily available, the type of product that is produced by British textile mills is no longer so easily absorbed."

DIRECTION OF TRADE (SEA-BORNE) 1949-50

Country	Percentage of shares	
	Exports	Imports
U.K.	22·23 p.c.	31·21 p.c.
India	10·01 ,,	15·27 ,,
France	8·73 ,,	—
U.S.A.	7·85 ,,	10·75 ,,
Hong Kong ...	7·55 ,,	—
Japan	6·86 ,,	8·44 ,,
U.S.S.R.	5·81 ,,	—
Germany	4·44 ,,	—
Italy	3·88 ,,	7·40 ,,
Other Countries ...	22·64 ,,	15·25 ,,
China	... ...	4·83 ,,
Netherlands ...	... ...	2·41 ,,
Egypt	... ...	2·30 ,,
Burma	... ...	2·14 ,,
	100 pc.	100 p.c.

The value of re-exports (1949-50) amounted to Rs. 762 lakhs and exports of Pak Merchandise through Calcutta was valued at Rs. 4,71 lakhs. The land-borne trade with the Indian Union in a normal year is estimated at Rs. 15 crores worth of imports and Rs. 80 crores worth of exports.*

QUESTIONS

1. What are the chief mineral products of Pakistan and where are they obtained?
2. Describe the distribution of population in Pakistan and account as fully as you can for the facts you state.
3. Write a short account of the transport systems of Pakistan so as to emphasise their importance in the Dominion.
4. On a sketch map of Western Pakistan show the regions where irrigation has much developed.
5. On an outline map of Eastern Pakistan,
   (*a*) shade the principal jute-growing areas;
   (*b*) indicate the main waterways with at least three river ports.
6. Write short notes on the following :—Lahore, Peshawar, Rawalpindi, Dacca and Narayangunj.
7. Describe the principal exports and imports of Karachi and Dacca.
8. What manufacturing industries, in your opinion, can be developed in Eastern Pakistan? (Cal. B. Com. 1949).
9. Examine the present position and the future prospects of the following industries in Pakistan : (*a*) Sugar industry; (*b*) Cotton mill industry.
10. Discuss the nature of trade between Indian Union and Pakistan.
11. To what extent is Pakistan dependent on Indian Union for the supply of consumption goods? Are there alternative sources available now for such goods? (W.B.C.S., 1949).
12. Describe the distribution of jute, cotton and wheat in Pakistan and relate their distribution to the geographical causes.

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* Source : Current Affairs, 1952 (Calcutta).

CHAPTER XVIII

BURMA

In her racial type and culture, as well as in her geographical position, Burma belongs to the Indo-Chinese Peninsula.

Burma occupies the north-western and western part of the great southward projection of the Indo-Chinese Peninsula. On the east lie the Chinese provinces of Yunnan, French Indo-China and Siam. To the north is the rugged region where India, China and Tibet meet. Burma presents the form of a kite, some 870 miles from north to south and 575 miles from west to east, *with a long tail extending to another 600 miles southward.* The coast-line is about 1,200 miles long and more broken than that of India.

Burma has an area of 2,60,000 square miles with a population of more than 16 million. The average density of population in Burma is 72 per square mile as compared to 496 in Japan, 250 in China, 247 in India, 140 in Philippines and 103 in Malaya. In fact, Burma's density is lower than that of all other countries of south-east Asia. The highest densities in Burma are confined to the divisions of Pegu, Irrawady and Mandalay with 215, 198 and 153 per square mile (1941). Pegu and Irrawady divisions have 2·9 and 2·7 million population followed by Tenasserim with 2·1, Sagaing 2·3, Magwe 1·9, Mandalay 1·9, Arakan 1·2 and Eastern States 2 million. Absence of large cities and the low proportion of flat and well-watered land are responsible for the low density in Burma.

The Burmans constitute roughly two-thirds of the total population. The Indian population is about 1 million.* The Burmans are noted for their generosity, hospitality and enthusiasm. They are known as *"the Irish of the East who have won all hearts"*. The people of Burma are mostly Mongolian and are generally better off and better educated than the Indians.

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* Because Burma has enough space to support a considerably larger population, it has been very attractive to Indians and Chinese immigrants. (L. D. Stamp: *Burma, an undeveloped monsoon country,* Geographical Review, XX, 1930)

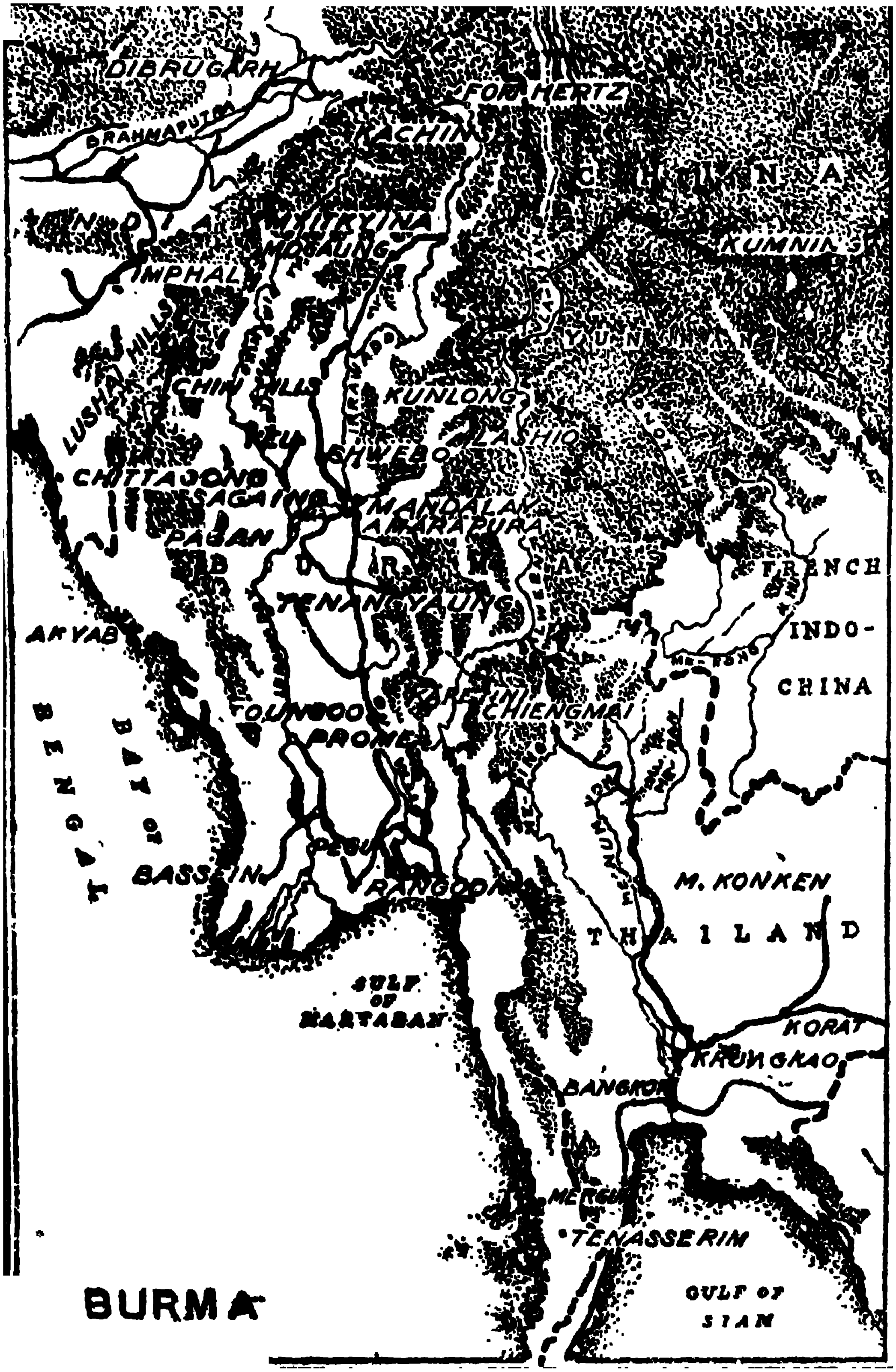

FIG. No. 176. The large size of the country with its sparse population and its industrial backwardness have created a problem of uniting the various regions by means of transportation.

They are open and frank, and they easily adapt themselves to those with whom they come in contact. Men and women enjoy equal rights in society. If the Burmans are not hard-working and enterprising it is because life in Burma has not been particularly strenuous. The prevailing religion is Buddhism, which is professed by about 85 per cent. of the population. The indigenous races of Burma are mainly of the Mongolian stock. There are three main divisions: (*i*) The Tibeto-Burman, (*ii*) the Mon-Khmr and (*iii*) the Tei-Chinese. They are more or less distantly related and connected ; although bitter at times, the assimilation and transformation of these races into a united Nation has been steadily progressing for centuries.

It is a country of mountains and valleys. Northern Burma is a land of steep, lofty mountains and narrow valleys, all covered by forests. The valleys of the Irrawady and the Sittang comprise level lands of rich alluvial soils which have extended to the extreme south along the coast of the tail of Burma.

The greater part of Burma being within the tropics, the climate is hot and damp. The hottest months are April and May when there is almost no rainfall. The monsoon breaks towards the latter part of May and continues almost daily until September. The delta and coastal areas are always humid. There are three seasons in Upper Burma, cold, hot and wet ; but scarcely more than two in Lower Burma, wet and dry, both of them hot.

The situation of Burma is very important : (*i*) She is a vital link in the air route from India to Australia. (*ii*) She has a common land frontier with Thailand, French Indo-China and China. The *back doors* into China are Lashio, Taungyi and Maymyo ; the Lashio route, commonly known as the *Burma Road,* is very important. (*iii*) She is also connected with the main sea-routes of the world.

Burma is an important source of many mineral products like petroleum, lead, zinc, tin, tungsten, nickel and cobalt.

MINERAL PRODUCTION IN 1948

Antimony ..	169 tons	Wolfram	78 tons
Lead ore ..	11,576 „	Tin ore	1,036 „
Zinc ore	2,943 „	Silver (oz) ..	415,099

She is sixth in the world in lead, second to China in tungsten, fifth among world producers of tin and an important producer of petroleum. The country, however, has not so far developed important industries based on those minerals, except for the petroleum refining industry. Other minerals are exported in the raw or semi-finished state. The oil-fields of Burma are confined to the valley of Chindwin and the Lower Irrawady. The main oil-field lies at Yenangyaung, and there is a pipe-line running to Rangoon. The total annual production is more than 300 million gallons, or one-half per cent. of the world yield. All the same, Burma's oil has political significance out of proportion to the amount produced. Rich deposits of tin are found in Tenasserim. Bawdin contains one of the largest deposits of silver in the world. Coal is found in the Chindwin valley where jade and amber mines are also worked. The Kalewa fields in the north-west Burma contain large deposits of fine quality coal, which, if properly developed, will make Burmese industry and transport free from foreign coal. The other minor minerals are rubies and wolfram, antimony, and salt. Exports of minerals are approximately equal to their production.

The forests of Burma cover nearly 60 per cent. of the total area of the province. There are six types of forests in Burma.*

I. Tidal forest along the Arakan and Tenasserim coasts.
II. Beach and dune forests above the high-tide limits of the Arakan and Tenasserim coast.
III. Tropical evergreen forests, where rainfall is over 120 inches. Bamboo is the typical one.
IV. Mixed deciduous forests where the rainfall is 40 to 120 inches. Teak and Padauk are the chief types in Upper Burma.
V. Dry forests on the edge of the Dry Zone are a source of tanning material.
VI. Sub-tropical and temperate forests are found on heights over 3000 feet with pines, oaks, fern and chestnuts.

Teak has always been the most valuable tree commercially, while *bamboo* is probably the most useful forest product from the point of view of the people. Teak is found on the Pegu Yomas and the eastern slopes of the Arakan Yomas and also on the Siamese border. The teak trees are dragged by trained elephants from the forest to a river to be floated down to the Delta ports. In recent years about 75 per cent. of the world's teak has come from Burma. Teak is unusually strong, durable and resisting to fungus. In 1939-40, Burma produced 400,000 tons of 50 cubic feet teak. Bamboo is put to several uses in Burma as household utensils, weapons, furniture, for making rafts and water conduits. The canes are becoming important for chair and basket industry.

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* *The Forests of Burma,* by E. F. Morehead (1944).

Burma is essentially an agricultural land. Nearly 71 per cent. of the population are engaged in agriculture and forestry. Agriculture occupies about 20 million acres of land.' Burma produces more than 5 million tons of rice annually. The Upper and Lower Irrawady valleys, the narrow coastal region on the west and Upper Tenasserim utilise more than 80 per cent. of their cultivated land for rice. The production of rice in 1948 was 5·4 million tons of which Burma has about 2 million tons of exportable surplus. India takes about half of Burma's rice export. Maize is cultivated in the central valley of the Irrawady. Sugar-cane is cultivated in more than 20,000 acres of land in the Upper Irrawady region. The Northern Shan States raise tea. Although *tobacco* is cultivated throughout the country, the western regions are more important, particularly the Arakan hill tracts. Other crops are cotton and oil-seeds.

CROPS AND ACREAGE IN BURMA

(1945-46)

Crops	Acres (000)	Production (tons in 000)
Rice	6274	2630
Maize	90	12
Sesamum	803	32
Groundnuts	375	76
Cotton	177	4

Waterways form the most important means of communication in Burma. *The river Irrawady* traverse the whole length of Upper and Lower Burma and is navigable from Rangoon for nearly 900 miles to Bhamo. It is the most important outlet of the heart of Burma, and the chief cities of the country are situated on its bank. *The Salwin,* though longer than Irrawady, is navigable only for 80 miles from its mouth. It is much interrupted by rocks and rapids.

The railways are all metre gauge and start from Rangoon. In 1940, Burma's railway mileage was 2060. The main line of the railway follows the Sittang Valley from Rangoon to Mandalay through Pegu. Another main line runs from Rangoon to Prome along the valley of the Irrawady. The branch lines are as follows: (*i*) Pegu to Martaban with a ferry across the river to Moulmein ; (*ii*) Moulmein to Ye and from Ye to Burma-Siam line ; (*iii*) Mandalay to Lashio ; (*iv*) Mandalay to Myitkyina ; (*v*) Henzada (on the Prome route) to Bassein.

Roads are not properly developed in Burma. The cost of making metalled roads is high because of the scarcity of good stone and the high cost of labour. There are only 17,000 miles of roads, of which 12,500 are motorable. The principal roads are: (*i*) the Burma Road, (*ii*) the Rangoon-Prome-Yenangyaung-Meiktila, (*iii*) Myingyan-Meiktila-Taunggyi-Siam, (*iv*) Sagaing-Shavebo-Kalewa-Imphal, (*v*) the Stilwell Road, (*vi*) Pegu-Thaton-Moulmein-Tavoy and Margin.

The Burma Road runs from Rangoon to Kunming, *via* Pegu, Mandalay, Maymyo, Lashio and Wanting. This route is open in all weathers throughout the entire length. The *Stilwell Road* runs from the Assam rail head at *Ledo* to Bhamo *via Myitkyina.* From Bhamo there is a road to connect it with the Burma Road through Namkham. The Stilwell Road was built for military purposes, although it passes through rich agricultural lands of Hukawng Valley.

There are no regular land routes between India and Burma.* The question of linking the road and railway systems of Burma and India may receive attention in near future.

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* "Burma has never had a road connection with India. Such a road could only have been built as a strategic road, as sea-freights would always be lower than the charges by land. The road project has often been discussed, and the possible routes have been surveyed, but the money for the construction has never been found. Before separation in 1937 India apparently did not think the scheme an urgent one; and since separation, Burma's finances were inadequate, and also the ministers who fear Indian immigration, would never agree to the construction of a land route which would increase the difficulty of checking or controlling the immigration." Sir H. Craw, the 29th April, 1942.

The principal trade centres are Akyab, Bassein, Tavoy, Moulmein, Mandalay, Bhamo and Rangoon. *Bhamo,* in Upper Burma, does considerable frontier trade with China. It is 200 miles above Mandalay. *Akyab,* on the western coast of Burma, is an important rice-exporting centre. Its great drawback is that it has no railway communication. It has a population of over 40,000. The principal imports are liquor, machinery, textiles and hardware. *Bassein,* on the south-west of the Irrawady Division, is situated at a distance of nearly 70 miles from the sea. It has direct railway communication with Rangoon. *Rangoon,* the chief port of Burma, is the capital of the country. It is situated on the Rangoon river and is about 25 miles from the sea. The principal imports are cotton manufactures, metals, provisions, silk, sugar, leather goods, machinery, paper, etc. The chief exports consist of rice, hides and skins, zinc, lead, timber, mineral oils, tobacco and rubber. It is connected by railways with the most important towns of the country. *Moulmein,* on the Gulf of Martaban, is a large port. It is connected by railways with Rangoon. The opening of the railway line has increased its importance, and much of the former import traffic of Rangoon is to-day handled by Moulmein. The chief imports are steel, sugar, provisions and gunny bags ; while the exports consist of timber, rubber, tin ore and tobacco. *Tavoy* is situated in the centre of the tail of Burma and is an important port. Wolfram and tin are the principal exports. *Mergui,* on the south-west coast of Tenasserim, is the centre of rubber and pearl-fishing industries. *Mandalay,* in Upper Burma,

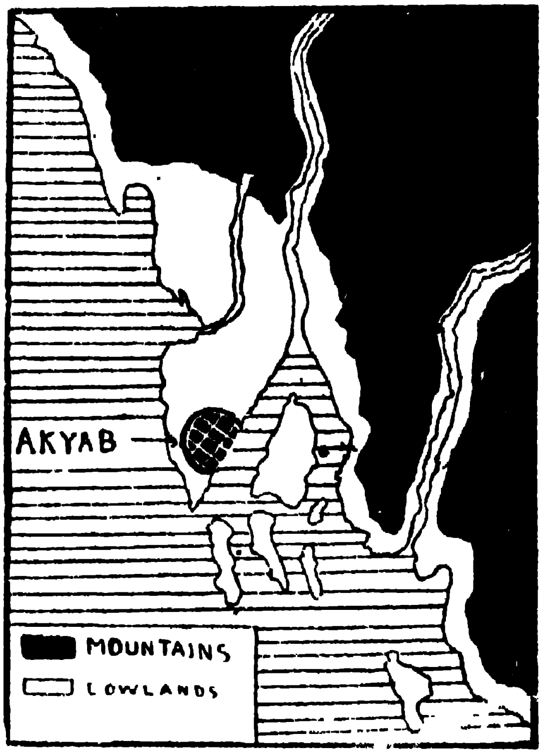

FIG. No. 177. Akyab and its hinterland. The port has no railway communication with hinterland.

is situated on the Irrawady river, about 400 miles north of Rangoon. Rice and silk are the articles of trade in the city.

Normally Burma has a favourable balance of trade. In 1948-49, her exports were valued at Rs. 733 million and imports at Rs. 373 million. Two-thirds to three-fourths of Burma's total exports consist of rice and petroleum, 90 per cent.. of the exports passes through Rangoon. Then, again, normally, 75 per cent. of Burma's exports go to India. The reasons for India's predominant position are: (*a*) Indian ports are close to Burma ports: (*b*) India is deficient in rice, petroleum and teak while Burma has exportable surplus ; (*c*) for many years there was free trade between India and Burma as the latter was a part of India till 1937 ; (*d*) till 1937, the currencies were same ; and (*e*) the trade of Burma till 1940 was largely in Indian hands.

Sea-borne Export Trade with Principal Countries

India	60 p.c.	St. Settlements	4·6 p.c.
U.K.	13·2 ,,		
Ceylon	5·5 ,,	Japan	4·0

In the matter of import, Burma takes manufactured commodities, consumers' goods and some iron and steel, coal and coke and machinery. About 50 p.c. of the goods are imported from India and 20 per cent from U.K.

Burma imports from India cotton (piece-goods, twist and yarn), jute, betelnut, pulses, wheat, iron and steel, cigarettes, tea, boots and shoes, fruits ; and, from abroad, cotton goods, machinery, iron and steel, chemicals, etc.

Burma sends to India rice, pulses, gram, oil, candles, tin, wood and timber.

The separation of Burma affected adversely the economic interests of India to a great extent. The fiscal protection granted to the various industries of India does not extend to Burma ; and, therefore, these Indian industries are to compete in Burma on equal terms with the products of foreign countries. Then, again, many Indian immigrants in Burma, who are working in rubber plantations and other industries, are looked upon as foreigners. The separation of Burma also made the position of India very unsatisfactory in respect of the supply of mineral oils, rubber, tin and wolfram.

"The two countries can benefit by fostering mutual trade. If the Burmese can be sure that their economic growth and interests will not be stifled or overlooked, and the Indians in Burma be assured that their status in Burma will be the same as that of Burmans, then Indo-Burma relations will be placed on a good footing and a better understanding between the two countries will be established."

QUESTIONS

1. Show how the main occupations of the people of Burma are dependent on geographical environment. (I. I. B., 1948).
2. Discuss the nature of trade between Indian Union and Burma.
3. To what extent are conditions favourable for the development of manufacturing industries in Burma?
4. Discuss the possibilities of industrial development in Burma. (Cal. B. Com. 1951).

CHAPTER XIX

CEYLON*

Ceylon is separated from the Peninsular India by the *Palk Strait* and connected with it by a line of islands known as *Adam's Bridge*. Physically the island is a part of the Deccan. The area of Ceylon is 25,332 square miles. Its length is 270 miles and its greatest width is 140 miles. The *Mahavila Ganga* is the longest river (134 miles) and flows to the north-east. It is navigable by small boats. Conditions of soil, temperature and rainfall have made Ceylon an agricultural country. The climate is more or less tropical, and there is rain throughout the year. The western side receives rainfall in the May-October season, while the eastern part gets it during winter. Plateaus and mountains occupy the central portion, and the other parts are plain. Only one-fifth of the total area is cultivated, and the remaining areas are either wastelands or covered with forests. Tea, rubber, cocoanuts and cinnamon are raised and exported. Coffee, cocoa and tobacco are also cultivated. The economy of Ceylon is inextricably bound up with its plantation industries, in particular tea and rubber. Of the minerals, limestones, gems and graphite are important. The railways run from Colombo to the north-west to Talaimannar, to the north of Jaffna and to the east of Trincomalee.

The population is a little over 6 million, the south-west being the most thickly populated area. Two-thirds of the people are Singhalese and nearly one-quarter Tamils. More than half the population professes Buddhism and one-fifth, Hinduism. The average density of population per square mile is 263.

Tea, rubber, copra and cocoanut oil are the chief items of export. Out of the total exports valued at Rs. 156 crores in 1950, the export of tea alone accounted for Rs. 75 crores. Ceylon exported in the same year Rs. 40 crores worth of rubber. With regard to tea, Ceylon is India's main competitor in the world market. Cinnamon, tobacco, timber and cardamom are also exported. The country imports rice, petroleum, cotton goods, motor cars, metals, coal and cement.

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* In 1948, Ceylon attained full responsible status within the Commonwealth of Nations. In view of its strategic position, naval and air bases have been retained by the U. K.

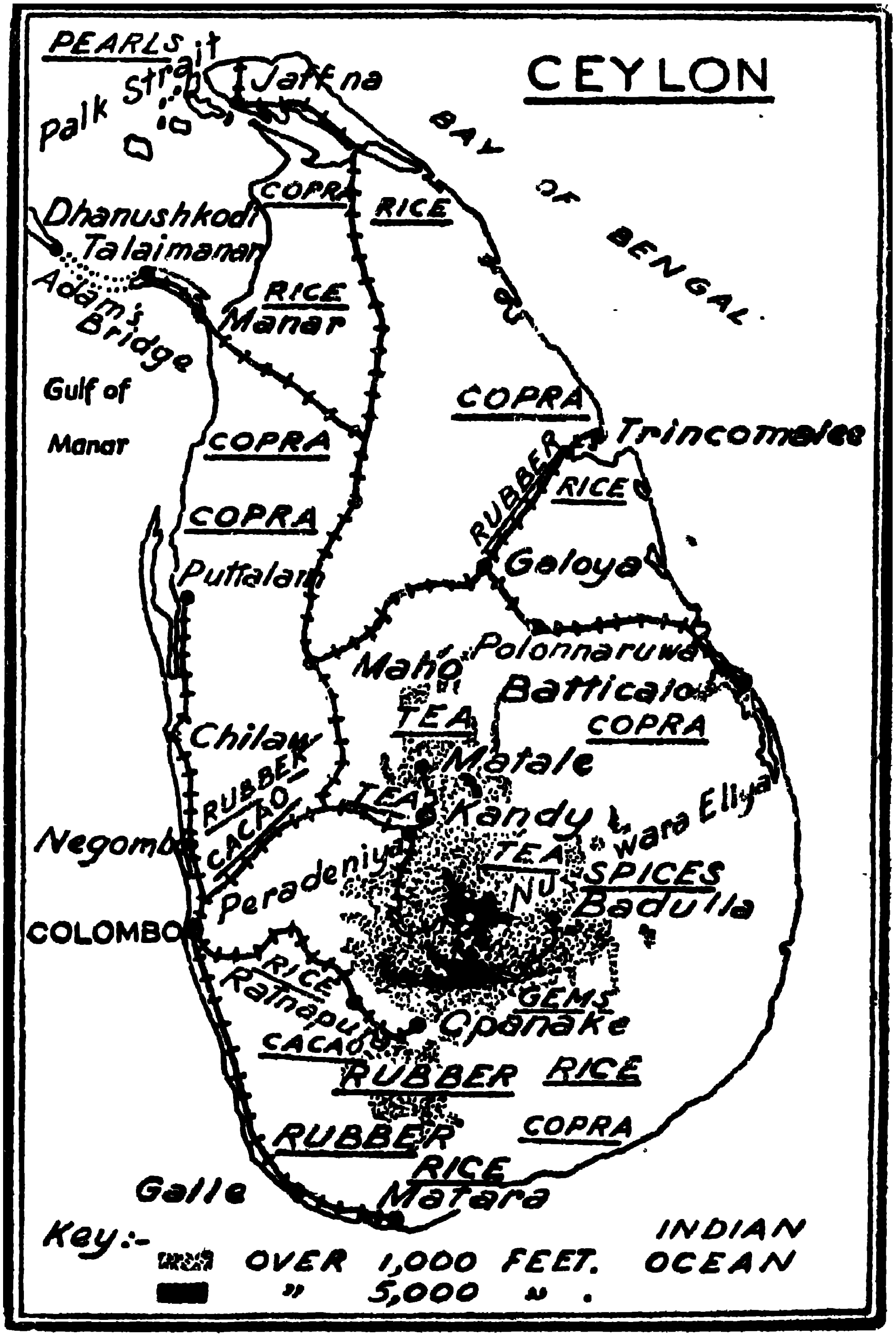

FIG. No. 178. Note the railway lines radiating from Colombo to Jaffna on the extreme north, Matara on the extreme south and Trincomalee on the north-east coast.

The value of total imports in 1950 was Rs. 117 crores of which rice accounted for Rs. 28 crores, cotton piece goods Rs. 12 crores, coal Rs. 2 crores, and sugar Rs. 6 crores.

India has always been playing a prominent part in Ceylon's foreign trade, though generally speaking, trade between the two countries is more competitive than complementary.* India sends cotton textiles, jute, pulses, fish, fruits, vegetables, rice, wood and timber. India can also export silk and woollen textiles, hosiery goods, blankets, carpets and rugs, soaps, books and cutlery.

Indian imports from Ceylon are confined to cocoanut products, spices and rubber. Other imports are rubber, spices and seeds. At present the best customer of Ceylon is U. K. followed by U. S. A.

Recently Ceylon has been manufacturing acetic acid, ceramic, glass, glue, hat, plywood, quinine, paper and coir. Ceylon Government initiated in 1948 a six-year economic and industrial development plan to make the country self-sufficient in essential foodstuffs.

Colombo, the capital of Ceylon, is a great entrepot port, occupying an important location in one of the principal highways of commerce between the East and the West. Its harbour is artificial, but a fine backwater encloses it. *Trincomalee,* on the north-east coast, is a port of minor importance. *Jaffna,* on the north, is an important town. *Kandy,* in the central highland, is the old capital.

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* The importance of Ceylon's foreign trade to India has special significance by reason of the fact that Ceylon's economy, being essentially a plantation economy, is based, in the main, on just three important commodities—tea, rubber and cocoanuts—that country is India's principal competitor in tea in world markets.

APPENDIX

I

COLOMBO PLAN STATISTICS

(A) COMPARATIVE LEVELS OF ECONOMIC DEVELOPMENT, 1949

	Unit per thousand population	India	Pakistan	U. K.	U.S.A.
Electricity production ..	'000 KWh.	13	1·9	1,033	2,296
Coal Consumption ..	tons	80	18	3,884	3,473
Petroleum Consumption	,,	7·8	11	327	1,638
Steel Consumption ..	,,	3·8	1·3	194	364
Cement Consumption ..	,,	7·2	3·6	148	229
Locomotives	number (per million population)	22	16	410	309
Carrying capacity of railway wagons ..	tons	10	8·8	276	556
Rail freight	'000 ton-miles	65	...	446	4,568
Load carrying road vehicles	number	0·18	0·17	16	43
All-Weather roads ..	miles	0·32	0·1	3·7	2·2
Telephones	number	0·37	0·21	98	261

(B) ANALYSIS OF INDIA'S PROGRAMME, 1951-57

Type of Scheme	Rs. Million	£ Million	Percentage of Total	No. of Schemes	
				In hand	New
Agriculture	6,080	456	33	104	27
Transport and Communications*	7,027	527	38	27	35
Fuel and Power ..	576	43	3	27	2
Industry and Mining (Exc. Coal)	1,800	135	10	21	23
Social Capital† ..	2,913	218	16	105	50
TOTAL ..	18,396	1,379	100	284	137

* Of which: Railways Rs. 4,800 million; Roads Rs. 1,099 million; Ports and harbours Rs. 100 million.

† Of which Education Rs. 1,144 million; Housing Rs. 183 million; Health Rs. 515 million.

(C) ANALYSIS OF PAKISTAN'S PROGRAMME

	Rs. Million	£ Million	Percentage of Total
Agriculture	820	88	32
Transport & Communications ..	530	57	20
Fuel & Power	470	51	18
Industry & Mining (Excluding Coal)	490	53	19
Social Capital	290	31	11
TOTAL ..	2,600	280	100

(D) ANALYSIS OF CEYLON'S PROGRAMME

	Rs. Million	£ Million	Percentage of Total
Agriculture	503	38	37
Transport & Communications .	297	22	22
Power	109	8	8
Industry	75	6	6
Social Capital	375	28	27
TOTAL ..	1,359	102	100

II

GEOGRAPHICAL DISTRIBUTION OF SPINDLES AND LOOMS IN INDIA—1951

States	Looms	Spindles
West Bengal	8,909	3,89,729
Bihar	745	25,700
U. P.	12,102	7,75,860
Delhi	3,322	1,20,628
East Punjab	780	38,264
Madhya Bharat	10,922	3,97,480
Madhya Pradesh	6,852	3,66,032
Rajasthan	3,029	1,32,868
Bombay	135,203	60,07,360
Bombay Island	65,880	28,66,150
Hyderabad	2,462	1,18,420
Mysore	2,877	1,61,752
Madras	7,976	16,30,054
Travancore	310	18,504

III. PROGRESS OF COTTON-GROWING IN INDIA

Year	Area under cotton (million acres)	Cotton area in p.c. of total cropped area	Yield in thousand bales of 392 lbs.	Average yield per acre in ib. of lint
1948-49 ...	11·293	4·6	2,300	80
1949-50 ...	12·173	4·8	2,971	96
1950-51 ...	13·859	5·8	3,300	94
1951-52 ...	15·600	—	3,400	

IV. PROGRESS OF COTTON INDUSTRY IN INDIA

Year	No. of mills	Looms in 000's	Spindles in 000's	Yarn produced million lbs.	Cloth produced. million yds.
1947-48 ...	408	197	9764	1329	3770
1948-49 ...	416	197	10145	1470	4298
1949-50 ...	420	198	10366	1303	3831
1950-51 ...	420	194	10999	1197	3718

V. PROGRESS OF JUTE MILLS IN INDIA

Year	No of Mills	Production (tons)	Exports (tons)	Persons employed
1947-48 ...	99	10,76,000	8,96,000	3,28,000
1948-49 ...	99	10,81,000	8,72,000	3,36,000
1949-50 ...	99	9,01,000	7,86,000	3,27,000
1950-51 ...	106	8,23,150	6,49,000	3,27,000

VI. PROGRESS OF SUGAR PRODUCTION IN INDIA

Year	No. of Sugar Mills operating	Area in 000 acres	Cane crushed in Mills (000 tons)	Sugar produced (000 tons)	Import of Sugar (000 tons)
1931-32 ...	31	2,972	1,784	158	586
1938-39 ...	139	3,270	7,004	651	331
1941-42 ...	150	2,944	8,026	751	30
1947-48 ...	134	4,056	10,910	901	14
1949-50 ...	139	3,624	9,901	975	—
1950-51 ...	139	4,138	11,009	1,100	60

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